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WALKING AS A SYMPTOM MANAGEMENT TECHNIQUE FOR ALZHEIMER'S DISEASE

BY

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Submitted to the Faculty of Graduate Studies and Research in Partial Fulfillment of the

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Abstract

The purpose of this study was to implement a walking program to determine if a daily walk would have the ability to decrease some of the inappropriate behaviours associated with AD. Using single subject time series design, 18 residents with AD, aged 73-99, participated in a 14 week program (two weeks baseline, 12 weeks intervention). The study involved two distinct groups: a walking + socialization group (experimental) and a socialization only group (control). The walking + socialization group (n= 14) went on daily guided walks and the socialization group (n= 4) had daily conversations with the walking technician, five days per week. Conversation was an inevitable part of the guided walks, therefore the socialization group was included to control for the possible effects of these daily conversations; any differences between the two groups should be a result of the daily walks. Single subject data, as well as collective data, revealed that 11 of the 12 participants in the walking + socialization group reduced their average number of inappropriate behaviours per day by at least 10%. On average, the walking + socialization group decreased their inappropriate behaviours by 39% over the 14 weeks. In the socialization group, only two of the four participants showed a decrease of 10% or more and together averaged a 64% decrease of inappropriate behaviours. The remaining 2 participants showed an average increase of 26%. Staff surveys, completed pre and post intervention, indicated that the extent of 'hassles' perceived by the staff decreased by 24%. This study found that a regular walking program provided individuals with Alzheimer's Disease an opportunity to reduce some of their agitation, while also reducing some of the burden placed on staff caring for this population.

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CHAPTER 1

Introduction

With the earliest babyboomers having entered their fifth decade of life in 1996, it is predicted that the number of Canadians over 65 years of age will increase threefold by the year 2030 (National Advisory Council on Aging, 1996). An expected result of this growth will be a substantial increase in the number of people affected with Alzheimer's Disease (AD). According to Jorm, Korten, & Henderson (1987), it is widely accepted that the predominant risk factor for Alzheimer's Disease is age. Consequently, the rate at which dementia increases is two-fold every 5.1 years after the age of 65 (National Advisory Council on Aging, 1996). According to the National Advisory Council on Aging (1996), it is estimated that by the year 2001, there will be as many as 364,000 Canadian seniors affected with some form of dementia, and as many as 778,000 by the year 2031. Over 300,000 Canadians or one in 13, over the age of 65 currently suffer from Alzheimer's Disease and related dementias (Alzheimer Canada, 1999). Clearly, research in this area is needed in order to deal effectively with this expanding population. Perhaps because Alzheimer's Disease is associated with cognitive decline, minimal research has looked at the physical aspects of the disease. Does this disease directly affect a person physically or is it that cognitive decline acts as a barrier to keeping physically active? Caregivers provide the assistance needed with activities of daily living (ADL's), however, too often the physical component in an individuals daily routine is given low priority.

Much is already known about the benefits of physical activity for individuals of all ages, therefore the purpose of this research project was not to look at the physical benefits of being physically active, but rather study the effects of physical activity as a

behaviour management technique. The purpose of this study was used to investigate the potential benefits of a walking program for adults with AD as a symptom management technique and to determine the effect of such a program on care staff burden.

Much of the focus on Alzheimer's Disease is investigating a cause or cure, however, this study focused on effectively dealing with the realities of AD for both the individual affected and the caregiver. Perhaps wandering is a way for individuals with Alzheimer's Disease to deal with their agitation, and if so, an intervention that includes a 'walking' component is appropriate. Walking is a functional intervention simply because it is a skill that commonly occurs and does not need to be taught to individuals with AD. In an article outlining the specific methods used to implement a walking program for residents with AD with the use of volunteers, Holmberg (1997) also informed the reader of the benefits of such a walking program. These benefits included behavioural management, decreased unstructured time of residents, decreased tension and worry about wanderers by nursing staff, increased social and physical benefits, increased willingness to retire for the evening and improved sleep patterns.

The caregivers of this population are also effected by the disease due to the increased demands placed upon them, therefore it was important to assess what impact this program might have on the staff caring for these individuals. Perhaps if a walking program has the potential to decrease some of the inappropriate behaviours associated with the disease, it will also have the potential to decrease some of the stress felt by care staff.

Two hypotheses were generated: (a) walking would reduce some of the inappropriate behaviours associated with the disease, and (b) caregivers would feel less hassled.

CHAPTER 2

Review of Literature

The benefits of exercise for the aging adult are extensive. Some of the benefits include increased cardiovascular function, strength and muscle mass, postural stability, psychological function, prevention of hip fractures, increased bone density, coordination, and balance (Butler, Davis, Lewis, Nelson, & Strauss, 1998). Although much is already known about the role of regular and moderate physical activity for the elderly in the prevention and rehabilitation of heart disease (Puugaard, Pedersen, Sandager, & Klitgaard, 1994), hypertension (Spina et al., 1993), diabetes (Rooney, 1993), osteoporosis (Grove & Londeree, 1992), and a host of disabling chronic diseases including arthritis (Stenstrom, 1994) and chronic obstructive pulmonary disease (Emery, 1994), there is little research linking physical activity and Alzheimer's Disease.. The disease has been documented since the turn of the century, yet it has received little attention in terms of research until recently. Much is known about the characteristics of Alzheimer's Disease, however little is known about its cause, cure or treatment (Ontario Advisory Council on Senior Citizens, 1986). First described by Dr. Alois Alzheimer in 1907, Alzheimer's Disease is characterized by progressive, multi-faceted loss of intellectual abilities and higher cortical functions, as well as personality and behavioral changes. The disease accounts for up to 75% of all dementia and may last, from onset to death, for up to 14 years (Ontario Advisory Council on Senior Citizens, 1986). The main mental changes associated with the progression of Alzheimer's Disease include gradual and profound memory loss as well as an inability to respond to sensory information. Also associated with AD is the development of aphasia, apraxia, or agnosia (Public Affairs Centre, 1990). According to Mace (1987), persons at any stage of AD

may be agitated, stubborn, frail, quarrelsome, incontinent and delusional, but also may feel stupid, clumsy and worthless. Functionally constructive activities of daily living seem to be lost, while problematic and often aggressive and energetic activities seem to replace them. Specifically, behavioral characteristics include constant movement such as pacing and rummaging, nocturnal wandering, short temper, anger towards care givers, fear of being alone, and a decline in personal grooming habits (Gorelick & Bozzola, 1991). In the past, care givers attempted to control wandering with the use of pharmacological or physical restraints (Namazi, Rosner, & Calkins, 1989); however, more recently researchers have questioned the appropriateness of these interventions (Cohen-Mansfield, Werner, Marx, & Freedman, 1991; Martino-Saltzman, Blasch, Morris, & McNeal, 1991; McGrowder-Lin, & Bhatt, 1988: Namazi, et al., 1989). Because AD affects social, physical and cognitive functions, the walking study focused on the biopsychosocial behaviors manifested through physical activity. The walking program study explored whether a regular walking program was an appropriate intervention for individuals diagnosed with Alzheimer's Disease in order to reduce some of the inappropriate behaviours associated with the disease.

Although the primary interest of this study pertained to adults who have AD, it also focused on the possible benefits for those caring for this population. According to, Rabins, Mace and Lucas (1982), as many as 80% of the caregivers of individuals with dementia have reported to be suffering from chronic fatigue, depression and anger. A more recent statistic states that approximately 16% of persons caring for someone in the community with mild dementia, and 40 % of persons caring for someone in the community with severe dementia, report symptoms of depression (National Advisory Council on Aging, 1996). Gallant and Connell (1998) examined the relationship between

the demands of providing care to a spouse with dementia and caregiver health behaviours. The results of this study indicated that caregiving for the AD population negatively influenced health behaviours, including exercise frequency, sleep patterns, weight maintenance and smoking and alcohol consumption. Perhaps an intervention that benefits sufferers of Alzheimer's Disease (i.e., decreased agitation), will also benefit their caregivers. (i.e., result in fewer demands from residents).

In an article that reviewed research findings related to exercise as a therapy for Alzheimer's patients and their caregivers, McArthur (1988) concluded that physical activity has the capacity to decrease depression, increase heart and respiratory function, increase skeletal muscle mass, delay the onset of osteoporosis, increase digestion and elimination, as well as decrease gas accumulation and sluggish bowel function. McGrowder -Lin and Bhatt (1988) studied the effects of walking, music and exercise, sensory stimulation, nourishment and dancing among adults with Alzheimer's Disease. A lounge was set up, such that everything in the room could be touched safely by participants. Residents participating in the study were taken, on a daily basis, to a large room for introductions and 30 minutes of simple exercises. Next the participants would either toss a ball or discuss current events. Refreshments were then served, followed by dancing and cool down exercises. Participants were exposed to the entire program for 90 minutes. Changes in behaviours were measured using the Wanderer's Lounge Evaluation form which requested that the charge nurses rate the frequency of occurrence of 11 behaviours (never, some of the time, most of the time, or all of the time). The instrument was completed for each resident on a daily basis over a period of 4 weeks. The results indicated that the five participants that completed the study (three others passed away) were able to participate in higher functioning activities both in and out of

the facility and in activities requiring them to sit for up to 30 minutes. In addition, one participant who normally requested to be toileted every few minutes became more continent of her bowel and bladder for more than 60% of the time. Wandering and aggressive incidents decreased, and improvements in appetite were noticed. Weight gain was also noticed in some group members because of improvements in appetite and the ability to feed themselves.

Blumenthal et al. (1991) examined the long-term effects of exercise on psychological functioning of older adults. The study included 101 men and women aged 60 to 83 years old. Each participant completed measures of mood and cognitive functioning and were randomly assigned to one of the following intervention groups for a period of four months: aerobic exercise (n= 33), yoga (n= 34) or control (n= 34). The results indicated that everyone in the aerobic exercise group improved in both exercise performance and cognitive functional capacity, regardless of their previous level(s) of exercise activity.

In a study by Beck et al. (1992), an exercise intervention was administered to patients with Alzheimer's Disease who exhibited such inappropriate behaviors as spitting, hitting and scratching. The intervention used music and exercise together, along with positive verbal reinforcement, three times a week for nine weeks. Outcomes included increased ability of exercise group members to follow directions, increased interactions among group members, and elimination of some inappropriate behaviors (i.e., swearing).

In a study by Namazi, Gwinnup and Zadorozny (1994), a low intensity exercise/movement program for patients with AD was done to (a) develop and assess the suitability of an exercise intervention for institutionalized residents, and (b) evaluate the effectiveness of the intervention with respect to frequency of inappropriate behaviours.

Eleven residents with AD participated in a 40 minute exercise/ movement program for 28 days, while a control group (n=11) participated in non-physical social activities that included reading and poetry. Behaviour observations were recorded by staff and graduate students 24 hours a day for the four week period using a modified version of the Cohen-Mansfield Agitation Inventory (14 items in total). Results revealed that 10 of the 11 patients in the exercise group remained in the program, and the group's average number of agitated behaviours decreased from 495 to 207. Meanwhile, the control group showed an increase in the average number of agitated behaviours, from 526 to 594. The study confirmed that the exercise/movement program was both appropriate and effective with respect to reducing the exercise group's agitated behaviours by more than 50%.

The research literature to date indicates that physical activity may reduce some of the complications associated with AD but it also suggests that physical activity may delay the onset of AD. A recent case-control epidemiological study conducted in Japan reported elevated odds ratios (O.R. or increased incidence over normal) for AD for head injury after age 60 (O.R.= up to 5.6); lack of hobbies at age 40 to 50 (O.R.= up to 4.9), infrequent physical exercise during middle age (O.R= up to 8.3); lack of involvement in sporting activities while on holidays (O.R= up to 3.2) (Kanamori et al., 1994). These researchers were among the first to identify an inactive lifestyle as a significant risk factor for AD.

Francese et al. (1997) measured the effects of regular exercise on muscle strength and functional abilities of late stage residents with AD and found that a regular exercise program increased muscle strength in individuals with senile dementia of the Alzheimer type (SDAT). The study included 12 non-ambulatory, late stage residents

who were assigned to either the experimental group (physical activity) or the control group (socialization). The intervention took place for 20 minutes, three times a week, for seven weeks, and incorporated the use of music, canes, bean bags, beach balls and parachute leg weights. The control group met for the same amount of time but received no physical activity intervention. Instead, they watched a sing-a-long music video for 20 minutes and then received a snack. The results indicated that two residents from the physical activity group went from using a wheelchair to using a walker, while others were able to perform ADL's with less physical assistance. With residents requiring less physical assistance from staff, the paper also pointed out the impact this may have on reducing the risk of back injuries to staff. The results also indicated that there were substantial positive changes in the staff's perceptions about the capabilities of the residents in the physical activity group.

Evidence about the role of physical fitness and exercise activity in optimizing the cognitive function of cognitively normal adults is readily available, although little is known about its role with those individuals that are cognitively impaired. However, the literature offers a number of potential explanations for the relationship of exercise and cognitive benefits. Friedman and Tappen (1991) examined the effects of a walking program versus a communication program with individuals with Alzheimer's Disease. The experimental group (n= 15) participated in planned walking which consisted of walking and engaging in a conversation with one of the investigators for 30 minutes, three times per week, for 10 weeks. The control group (n= 15) participated in conversation with the investigator for the same amount of time. The Communication Assessment Scale (CAS) and the Communication Observation Scale (COS) for the cognitively impaired were administered prior to and after the 10 week intervention. Results indicated that there were significant

improvements in communication for the walking group as measured by the COS (pre test M= 18.40, SD= 4.48; post test M= 22.92, SD= 5.8) and the CAS (pre test M= 45.40, SD= 12.17; post test M= 59,60 SD= 13.33. Contrary to predictions, the conversation-only group actually decreased their communication a small amount (pre test M=17.06, SD= 5.57; post test M= 16.86, SD= 5.61) and showed only slight gain (pre test M=45.60, SD= 13.11; post test M= 46.63, SD= 13.34) on the CAS. The investigators postulated that because the neurons that control the physical activities of communication are located close to the neurons that control walking in the motor cortex, neural activity generated in the motor cortex by walking primes some of the motor circuitry involved in communication. Thus walking caused the functional levels of communication to improve. Emery and Blumenthal (1991) acknowledge that exercise improves cerebral blood flow, thus leading to an enhanced neurotransmitter metabolism.

A year long study of 121 sedentary older adults by Hill, Storandt, and Malley (1993) revealed changes in a variety of cognitive tasks and memory tests with those individuals who engaged in a year long endurance exercise training program. Numerous other studies support these findings (Blumenthal et al., 1991; Hawkins, Kramer, & Capaldi, 1992; Stevenson & Topp, 1990).

Another possible explanation for correlating physical exercise with improvements in cognitive function is explained by increased activation of the central nervous system. In particular, the neural activation and stimulation of the reticular activating system may lead to improved attentional focus (Stelmach, 1994). Emery (1994) found that 64 adults with Chronic Obstructive Pulmonary Disease, ages 53 to 82, significantly enhanced their psychomotor abilities and aerobic fitness after participating in a four week program comprised of four hours of breathing therapy, warm up exercises, 45

minutes of walking or cycling and upper body strengthening , 5 days per week.

Palleschi et al. (1996) examined the effects of aerobic training on the cognitive performance of 15 elderly males with SDAT. Participants were classified at phase 4 or 5 (on a scale of 1-7) of the Reisburg's global deterioration scale (Reisberg et al., 1982) and had values of 18-21 (highest possible score = 36) on the Mini Mental State Examination (MMSE) scale (Folstein et al., 1975). Participants were required to exercise on a cycloergometer for 20 minutes, three days a week over a period of 3 months at approximately 70% of their maximal pulse frequency. Tests measuring attentional matrix, verbal span, supraverbal span and MMSE were conducted pre and post intervention. Improvements were made on all measures suggesting that aerobic training can improve the cognitive functions of SDAT afflicted persons.

Throughout the literature it is suggested that individuals with AD are understimulated, and therefore their environments should include daily activities, such as music and exercise (Peppard, 1991; Rader and Hoeffer, 1991). Providing a daily walking program may provide the stimulus enhanced environment necessary to decrease some of the inappropriate behaviours associated with AD. The suggestion that an enhanced environment may be a more effective symptom management technique is supported indirectly by a behaviour observation study done by Cohen-Mansfield, Marx, and Werner (1992). The researchers contrasted the frequency of agitated behaviours exhibited by nursing home residents when they were unoccupied to when they were involved in an activity. The results indicated that residents exhibited less pacing and fewer repetitious mannerisms when they were involved in social interaction, activities of daily living, structured activities or relocating to another room when they were inactive. Perhaps individuals with AD engage in inappropriate behaviours as a means to increasing their

own levels of stimulation.

CHAPTER 3

Methods

Participants

Participants included 20 individuals from a long-term care facility. Criteria for inclusion in the study required that all participants be sedentary, ambulatory, diagnosed with senile dementia of the Alzheimer type (SDAT), and exhibit behaviours that care staff considered inappropriate. Of the 20 participants, 15 were placed in the "walking + socialization" group and 5 were placed in the socialization group. Random assignment was not possible because it was thought by 5 of the guardians/closest relatives that a walking program was not suitable for their relative, however, they did consent to their family member being a part of the socialization group. As a result, those chosen to be in the "walking + socialization" group were residents that had been given consent to be involved in the walking group and that the facility manager thought were most likely to adhere to the program. Those in the socialization group were residents that had been given consent to be a part of the socialization group, but not the "walking + socialization" group. The "walking + socialization" group consisted of 5 men and 10 women, while the socialization group consisted of 5 women. The age range of all the participants was 73-99 years old, with the average age being 85 years old. Please refer to Table 1 for the age, sex, diagnosis and length of stay each participant had at the facility prior to commencement of the study.

The "walking + socialization" group was defined as those participants that went on a daily walk with the walking technician while engaging in some form of conversation. The socialization group was defined as those individuals that did not go for a daily walk,

but instead sat and had a daily conversation with the walking technician. During the study, two residents, one from the socialization group and one from the walking group passed away and another individual (walking group) was discharged five days prior to the last day of the study. A fourth participant (walking group) chose not to go for a daily walk after week 8 and a fifth participant (walking group) chose not to go for their daily walk after week 9, however staff continued to collect data on these individuals.

The data collected for the two individuals that passed away is not included in any of the data analysis. The data for the individual who was discharged to another facility is included, as is the data for the individuals who chose not to participate after week 8 and week 9.

Facility

The study took place at a new long- term care Alzheimer facility in Edmonton that had only been open 7 months prior to the commencement of the study. This time frame gave residents an opportunity to adapt to their new environment, therefore minimizing the possibility of inappropriate behaviours being associated with an unfamiliar environment. This particular facility was specifically designed to house older adults who had a diagnosis of SDAT and were ambulatory. The layout of the facility was divided into three different 'houses' (blue, green and rose) each with 12 bedrooms, one common eating area, a medical room, and a kitchen. The facility had accessible outdoor walking paths, as well as ample room for walking indoors.

Staff

For data collection purposes staff involvement was crucial. The study required a minimum of five staff members per day per house (15 in total). It was not necessary that the same care staff assess the same participant throughout the study, but rather that

an accurate daily assessment was made. This procedure allowed for participating staff to be absent or work a different shift, while their replacement staff did the assessments.

All Licensed Practical Nurses (LPN) and Resident Care (RC) attended a briefing session about the walking program conducted by the investigator. This briefing session explained the length of the study, care staff involvement, and an overview of how to record data. A sample of a customized data sheet (Appendix A) was provided for each staff member in attendance and they were asked to carefully review it. The importance of filling out each sheet accurately was emphasized. Staff were informed that each of the five daily shifts would be provided with a clipboard containing customized data sheets for the study participants, and that they were only responsible for recording the behaviours of individuals indicated on the sheets. At this time, staff were given an opportunity to ask questions about the walking program and their involvement with it.

Following this orientation, each staff member was provided a form (Appendix B) to record the most common inappropriate behaviours (maximum of five) associated with each resident participating in the study. The form was completed by each staff member independently and returned to the investigator within 72 hours. Once the forms were completed and reviewed by the investigator, a customized data sheet was prepared for each resident, based on the number of times a behaviour was recorded by the staff. If a behaviour was recorded by more than 35% of the staff, the behaviour was included as a target behaviour on the customized data sheet. For each resident, between two and five inappropriate behaviours were identified overall. A total of 13 different behaviours were identified to describe the 20 participants: verbally abusive, physically aggressive, trying to leave facility, disturbed sleep, layering, hoarding, unwarranted crying, repetitious mannerisms, unwarranted requests, going into other's rooms, territorial, loner and

seeking attention. A list of these behaviours and their definitions (Appendix C) were posted with the data sheets for staff to refer to when recording their observations.

Walking Technician

In order to facilitate the daily program, a walking technician was hired. The Alzheimer Society was contacted and asked to recommend a suitable person for the project. The principal investigator interviewed the recommended individual and concluded that she was suitable for the position because she was knowledgeable about AD and understood the needs of this population. She also had volunteer experience in the Alzheimer setting, a strong work ethic, a caring and humorous nature, a flexible schedule, and was capable of walking for long periods of time. A security clearance was completed and this individual was hired. The walking technician's responsibilities included guiding and facilitating walks with study participants from the "walking + socialization" group, and conducting conversations with those in the socialization group. Background information on all participants was given to the walking technician in order to facilitate conversations of personal interest. The walking technician also had the responsibility of recording the length of time spent with each participant, regardless of the intervention. This information was recorded in a logbook on a daily basis and kept in a locked cabinet. Participant names were coded in the logbook and language was used in such a way that the participants could not be identified.

Procedures

Ethics approval was obtained from the University of Alberta health research ethics board prior to the start of the study. A cover letter (Appendix D), project summary explaining the study (Appendix E), and a consent form (Appendix F) was mailed to the guardian/closest relative of each eligible resident (n= 36) four months before the

start of the study. The purpose of the study, the extent of the participants involvement, as well as the risks and benefits of the study were outlined. The mail out was repeated two months later to those individuals that had not already responded. Phone calls were made when necessary to those individuals that had expressed concerns with regards to the frequency and intensity of the intervention. In total, 24 consent forms, out of the 36 that were mailed out, were returned. Of these 24 consent forms, only 20 of the residents fit the inclusion criteria. The four residents that did not meet the inclusion criteria were considered too active. One of the four residents was a highly fit individual and as a result, was taken out twice a week for a 30 minute run. The remaining three residents joined the walking group on many occasions, however, data was simply not recorded for these individuals.

Participants in the study were approached and invited to go for a walk five days a week (Monday to Friday) in groups of 3-5. If another participant wanted to join the group at anytime during an already existing walk, they were free to do so and the walking technician would simply keep track of the walking time spent with her. For the first six weeks of the study the walking program took place between the hours of 1:00pm to 4:30 pm. As the study progressed, so too did the amount of time spent walking, therefore the walking program hours were extended by two hours (10:00 am to 12:00 noon) and then continued with the 1:00-4:30pm shift. Weather permitting, participants were taken outdoors for a walk on facility grounds. The majority (three out of four months) of the program took place during winter months, therefore most of the guided walks took place inside the facility, using the hallways around a large common room.

The total time spent walking varied from a minimum of 10 minutes to a maximum of 70 minutes per day per participant. Those in the "walking + socialization" group were

required to walk a minimum of 10 minutes per day in order for their participation to be considered relevant. Canada's physical activity guide to healthy active living recommends that individuals add up their physical activity time "in periods of at least ten minutes throughout the day", therefore ten minutes was chosen as the minimum criterion for the walking group. This minimum time criterion also ensured that the individual was participating and not merely walking from one area of the facility to another.

Socialization sessions also took place 5 days a week (Monday to Friday), however these took place on a one-on one basis. Most of the socialization took place in the participants rooms with the total time spent socializing varying from 2 minutes to 25 minutes per day per resident. Residents were not always talkative or willing to engage in a conversation, therefore for data collection purposes, a two minute conversation was counted as the minimum criterion for the socialization group. If participants from either the "walking + socialization" group or socialization only group did not meet these minimum criteria, they were considered as not having participated that day. The minimum intervention time for each group was different because it was much more difficult to just 'socialize' with the socialization group than to 'walk' with the "walking + socialization" group. The walking technician found it more difficult to increase the time spent with the socialization group because many of the participants were shy and liked to keep to themselves. Therefore, the average time spent with the socialization group was much lower than the time spent with the "walking + socialization" group.

Data Collection

When studying such a diverse population, it is not useful to make statistical generalizations, therefore a single-subject, time series design was utilized. The purpose of the single subject design was to allow the investigator to study each participant on an

individual basis and avoid "the perils of averaging data in physical activity research" (Bouffard, 1993 p.371). The time series design allowed each participant to act as their own control. Prior to the start of the program, a behavioural baseline for each participant was established by the care staff. To establish this behavioural baseline, participants were monitored for their respective inappropriate behaviours 24 hours a day for 14 days. Thereafter, inappropriate behaviours were monitored by care staff 24 hours a day, seven days a week for 12 week intervention phase. In order to consider a decrease of inappropriate behaviours meaningful, a criterion of 10% was set prior to the start of the study.

Customized data sheets for each participant were kept on a clip board that was stored in a locked medical room in each house. These sheets were very accessible, but for confidentiality reasons it was important that these sheets be kept locked up. If a behaviour was observed that was on a participants customized data sheet, the care staff recorded it with a check -mark. The number of check marks indicated the number of times the behaviour was observed. The customized data sheets were broken down into each hour of each shift so staff could check off the behaviour at the time it was observed and avoid retrospectively recording their observations at the end of their shift. If a behaviour was observed by another staff member, that staff member would report it to the appropriate care staff and the behaviour would be recorded with a check mark surrounded by a circle. This method was used to avoid two different staff members recording the same behaviour, and ensured that an observed inappropriate behaviour was recorded, regardless of which care staff member observed it. This method also allowed house keeping staff and the recreation therapist to report their observations to the appropriate care staff member(s). For each shift (7:00am-3:00pm, 8:00am-1:00pm,

1:00pm-9:00pm, 3:00pm-11:00pm,11:00pm-7:00am) a care staff was assigned three to four residents, with the exception of the night shift. During the 11:00pm-7:00am shift, six to eight residents were assigned to the appropriate care staff simply because there were fewer responsibilities and time commitments during this shift.

Due to the overlapping of shifts, a total of three data sheets per day per participant were collected in order to track the participants 24 hours a day. For each 24 hour period, totals were computed for each of the separate behaviours and then all behaviours were summed together to illustrate a daily total. Because frequency of behaviours per 24 hour period was the focus of the walking study, any missing data sheets within the 24 hour period required the entire day's data to be considered missing.

Lastly, the Caregiver's Hassles Scale (CHS) (Appendix G) was completed by 25 care staff at the end of the baseline period (week 2) and at the end of week 14. The scale was used to assess the daily hassles of caring for an individual with Alzheimer's Disease. The scale was based on 5 sub-scales: (a) hassle assisting with basic activities of daily living (ADL); (b) hassle assisting with instrumental ADL; (c) hassle with care recipient's cognitive status; (d) hassle with care recipient's behaviour, and (e) hassle with caregiver's support network. The test-retest reliability for the full scale was $r = .83$ and the internal consistency was $\alpha = .91$ over a one- day interval. The full scale was found to be "a reliable and psychometrically sound instrument for assessing hassles associated with assistance in basic activities of daily living (ADL), assistance in instrumental ADL, care recipients' cognitive status, care recipients' behaviour and caregivers social network" (Kinney & Parris Stephens, 1989, p. 328).

The CHS consisted of 42 items, however only 34 items were chosen for the study because 8 of the items were not relevant to a facility setting. (i.e., leaving care recipient

with others at home). Staff were required to indicate which events occurred during the past week, whether they were considered a hassle, and to what extent. If an event did not occur within the last week, the staff were instructed to circle the word "no" and then move onto the next item. If an event did occur, staff were asked to circle "yes" and then indicate on a 4 point rating system the extent to which they felt it was a hassle. The 4-point rating system included 'not at all a hassle' (0), 'somewhat a hassle' (1), 'a hassle (2) and, a 'great deal of hassle' (3). For each of the 34 items, a total score was calculated, followed by an overall 34 item total (Table 2).

Staff were not required to identify themselves on the questionaires, therefore staff were asked to enter a draw for a prize once they had completed the questionaire. It was confirmed that the number of names put into the draw equaled the number of questionaires filled out. These names were then used to ensure that the same 25 staff filled out the questionaire during week 14. Written instructions on how to fill out the questionaire were provided as well as a verbal explanation by the investigator to each of the care staff. If care staff needed clarification or had any questions, they were given an opportunity to ask the investigator or contact her by phone.

Pilot Project

Prior to the main study, a four week pilot study (one week baseline, three weeks intervention) was completed at a long-term care Alzheimer facility in Edmonton. This site was chosen because the facility layout and the residents it housed were similar to the facility chosen for the main study. The pilot project included six residents with AD, five in the "walking + socialization" group and one in the socialization group. The purposes of the pilot project were to:(a) test the feasibility of the intervention (walking or socialization); (b) test the appropriateness of the assessment process; (c) determine

the time commitments required of staff; (d) investigate the suitability and potential effectiveness of a walking program in an Alzheimer setting; and (e) provide the walking technician the opportunity to practise walking with the residents and become familiar with the facility. The findings of the pilot project indicated that the proposed program was very feasible, in that walking was found to be a suitable form of physical activity that did not require additional equipment or staff. The assessment process worked well, such that the care staff were able to complete the customized data sheets on a daily basis. A staff burden questionaire was administered daily, however the questions were not answered properly and did not elicit the information required for the purposes of the study. As a result, the Caregivers Hassles Scale by Kinney and Parris-Stephens (1989) was administrated to care staff at the end of week 2 and week 14 during the main study. Some of the data sheets were incorrectly dated and as a result were unable to be used. To avoid this, data sheets were pre-dated by the investigator for the main study. Lastly, the time commitment required by care staff to complete the assessment instrument did not have any noticeable effect on their workload. The pilot project also indicated that more complete data was obtained if the housekeeping staff and the recreation therapist reported their observations to the care staff, rather than recording it themselves.

CHAPTER 4

Results

Of the original 20 participants, five did not complete the study. Two individuals passed away, one was transferred to another facility and two chose not to complete the study. Of these five participants, four were from the "walking + socialization" group and one was from the socialization group. The data for the participants that passed away has not been included in any of the data analysis. The remaining participants have had

their data analyzed individually, however, their data has not been included in group totals and group averages.

This section summarizes the data collected for each of the 18 participants, however, participants 6, 9 and 15 did not complete the full 14 week program. A descriptive overview of each person's data is presented, followed by a table, which is followed by a graph. Participants 1-4 represent the socialization group and participants 5-18 represent the "walking + socialization" group. The tables illustrate the data collected for the 14 week period and include the frequency of each named behaviour on a weekly basis, as well as the total time spent walking and/or socializing each week. The graph included for each participant illustrates: (a) the average amount of intervention time spent per week; (b) the average number of inappropriate behaviours on intervention days; (c) the average number of inappropriate behaviours on non- intervention days (weekends or missed intervention days), and (d) the average number of inappropriate behaviours during the two week baseline period. Lastly, the results from the Caregiving Hassles Scale are discussed and displayed (Figure 19).

Participant 1

This 84 year old woman was approachable and openly participated in conversations with the technician. This individual had a compliance rate of 82%. The inappropriate behaviours specific to this individual included being verbally abusive, hoarding, and being a loner. This individual did not show any decreases in inappropriate behaviours with the addition of the social component five days a week. During the two week baseline, this individual averaged 5.5 inappropriate behaviours per day during week one and 7.5 behaviours per day during week two. At mid point, this individual averaged 5.9 and 6.9 inappropriate behaviours per day, respectively. During the last two weeks of the study this individual averaged 7.3 and 8.6 inappropriate behaviours per day. As the table indicates, the average number of inappropriate behaviours increased gradually over the 12 week intervention.

Figure 1 illustrates that over the 14 week duration this individual's time spent socializing varied considerably, however, their time spent socializing was higher at week 14 than at week one. Small increases over time with respect to the number of inappropriate behaviours were observed on both social and non-social days.

Table 1

Weekly total of inappropriate behaviours for participant 1

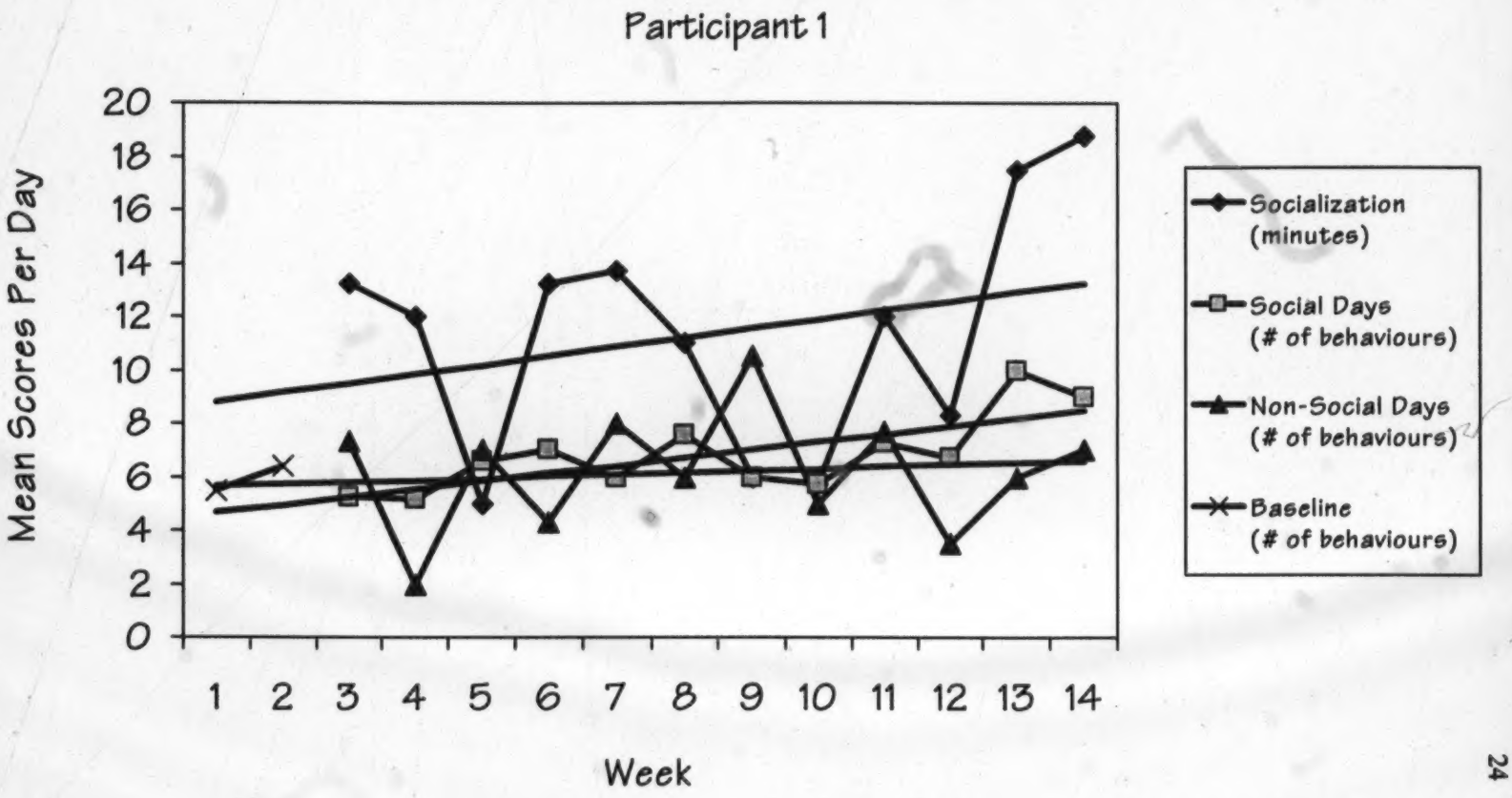
Weekly Total of Inappropriate Behaviours														
	Week													
	1 *	2 *	3	4	5	6	7	8	9	10	11	12	13 *	14 **
Verbally Abusive	1	0	0	0	5	1	2	0	0	1	2	6	3	2
Hoarding	13	14	12	12	11	13	10	11	15	13	20	9	8	16
Loner	19	31	31	18	32	27	36	39	36	29	30	19	33	25
Total	33	45	43	30	48	41	48	50	51	43	52	34	44	43
Social Time	0	0	56	60	15	53	55	55	30	23	48	25	35	90

Note:

* one day of missing data

** two days of missing data

Figure 1. Mean # of Inappropriate Behaviours on Social and Non-Social Days and Mean Socialization Time Over 14 Weeks



Participant 2

This 81 year old participant always socialized when approached and had a compliance rate of 85%. Many of this individuals inappropriate behaviours were related to getting attention from staff and visitors. Behaviours included seeking attention, unwarranted crying, verbal abuse and disturbed sleep patterns. The data indicates that with the addition of daily socialization, this participant decreased their inappropriate behaviours significantly. During the first week of the two week baseline, this individual averaged 7 inappropriate behaviours per day. During the second week this individual averaged 11.6 inappropriate behaviours per day. At weeks six and seven, this individual averaged 12 and 6.9 inappropriate behaviours per day, respectively. During the last two weeks of the program this individual averaged 4.4 and 3.3 inappropriate behaviours per day, respectively. Overall, this individual decreased her inappropriate behaviours by 59%.

Figure 2 illustrates that over the 14 week duration this individual's time spent socializing varied considerably but did decrease over time. There were large increases initially with respect to the number of inappropriate behaviours observed on social days, however as time progressed the number of inappropriate behaviours on social days decreased. On non-social days the number of inappropriate behaviours also decreased over time.

Table 2

Weekly total of inappropriate behaviours for particpant 2

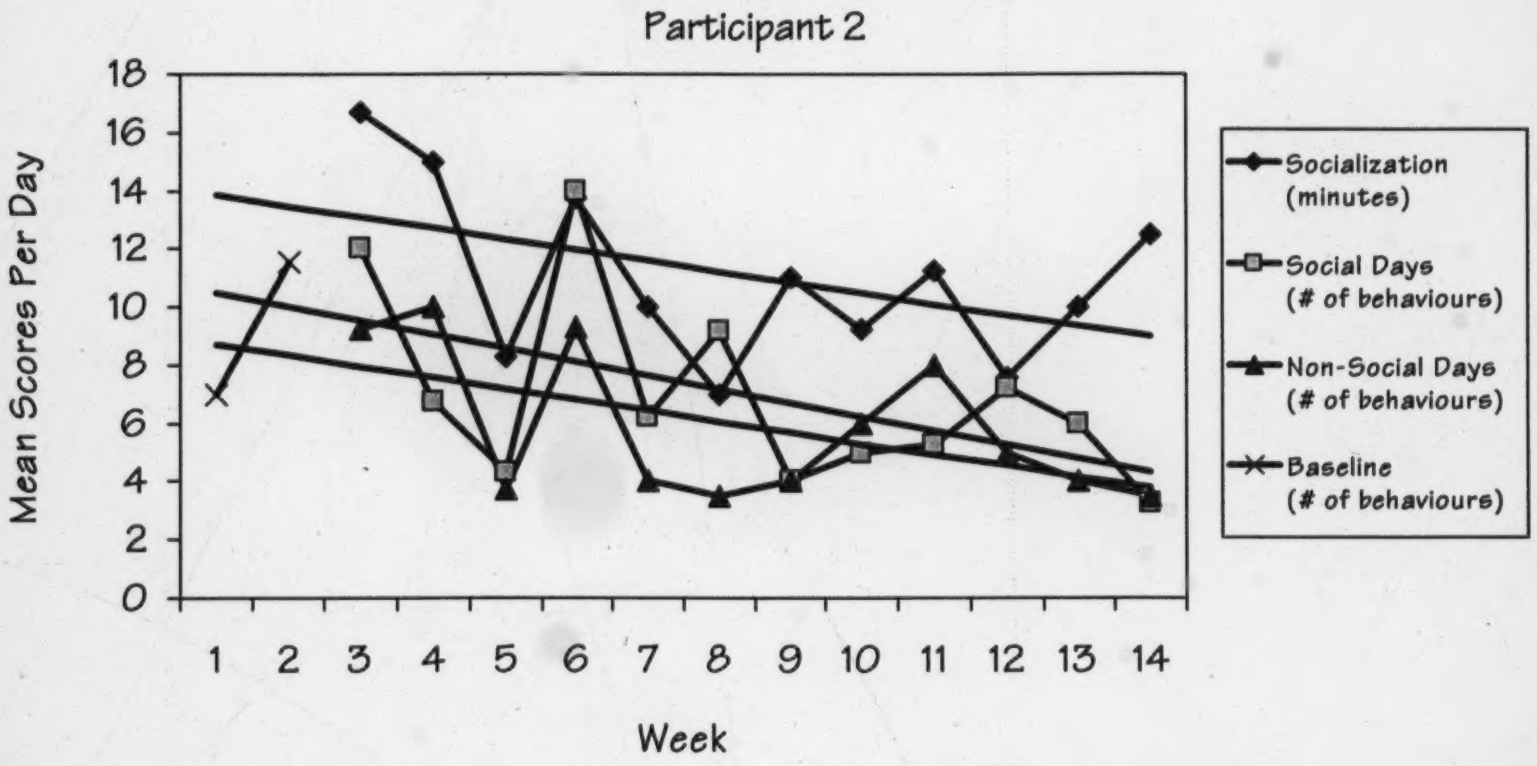
Weekly Total of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6	7	8	9	10	11 *	12	13 **	14 *
Seeking Attention	26	53	38	35	11	48	36	22	14	17	17	30	13	11
Disturbed Sleep Patterns	19	12	21	13	12	29	6	17	11	21	10	12	9	9
Verbally Abusive	0	7	2	1	1	3	1	1	0	0	3	2	0	0
Unwarranted Crying	4	9	12	6	4	4	5	4	3	0	7	2	0	0
Total	49	81	73	55	28	84	48	44	28	38	37	46	22	20
Social Time	0	0	50	60	27	55	50	30	55	37	45	38	25	55

Note:

* one day of missing data

** two days of missing data

Figure 2. Mean # of Inappropriate Behaviours on Social and Non-Social Days and Mean Socialization Time Over 14 Weeks



Participant 3

This 73 year old woman was very quiet and didn't initiate conversation but was happy to engage in a conversation when approached. Her compliance rate was 80%. The inappropriate behaviours that this individual was monitored for included loner, unwarranted requests and verbal abusiveness. During weeks one and week two, this individual averaged 5.7 and 8.1 inappropriate behaviours per day, respectively. During the sixth and seventh week, the average number of inappropriate behaviours were 9.4 and 8.2. At week 13 and week 14 of the study, the average number of inappropriate behaviours per day for this individual was 9.0 and 8.7. For the most part, this individual did not exhibit a high number of inappropriate behaviours during the two week baseline, therefore it was difficult to make any sound conclusions as to the appropriateness of this intervention for this individual.

Figure 3 illustrates that over the 14 week duration this individual's time spent socializing gradually decreased over time. The number of inappropriate behaviours observed on social days decreased over time, while the number of inappropriate behaviours on non- social days increased slightly.

Table 3

Weekly total of inappropriate behaviours for participant 3

Weekly Total of Inappropriate Behaviours														
	Week													
	1	2	3	4	5 *	6	7 *	8 *	9	10	11 *	12 ***	13 **	14
Loner	38	54	52	59	29	65	46	40	56	57	48	22	42	61
Unwarranted Requests	1	2	1	2	2	0	1	0	0	0	0	1	1	0
Verbally Abusive	1	1	3	1	1	1	2	1	0	0	0	1	2	0
Total	40	57	56	62	32	66	49	41	56	57	48	24	45	61
Social Time	0	0	45	45	25	40	40	30	40	30	35	35	50	15

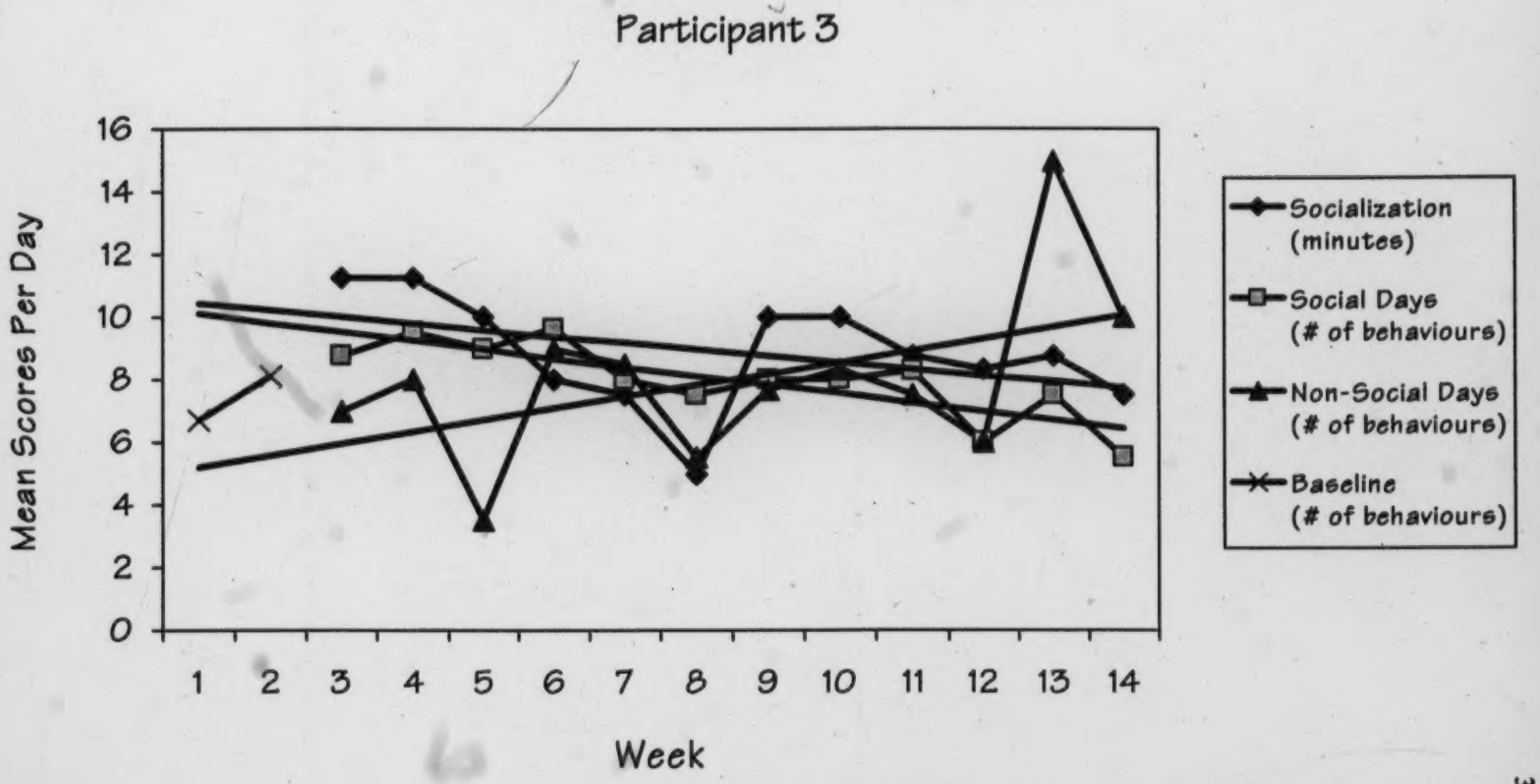
Note:

* one day of missing data

** two days of missing data

*** three days of missing data

Figure 3. Mean # of Inappropriate Behaviours on Social and Non-Social Days and Mean Socialization Time Over 14 Weeks



Participant 4

This woman was 73 years of age and was observed the walking technician as shy and quiet and difficult to engage into a conversation. Her compliance rate was 67%. However, as time went on, the frequency and length of conversations increased. This participant was being monitored for unwarranted crying, unwarranted requests, verbal abusiveness, and for territorial behaviour. The average number of inappropriate behaviours per day during week one and two were 9.8 and 4.9, respectively. During the sixth and seventh week the average number of inappropriate behaviours per day were 2.5 and 3.4. During week 13 of the study this individual exhibited 2.4 inappropriate behaviours per day, followed by 2.3 inappropriate behaviours per day during week 14. Overall, the frequency of inappropriate behaviours per day decreased by 68%. This indicates that socialization may be important to this person, although they did not appear to be a very sociable person.

Figure 4 illustrates that over the 14 week duration this individual's time spent socializing showed gradually increases by week 14. The number of inappropriate behaviours observed on social days decreased over time, while the number of inappropriate behaviours on non- social days showed more variability and increased only slightly.

Table 4

Weekly total of inappropriate behaviours for participant 4

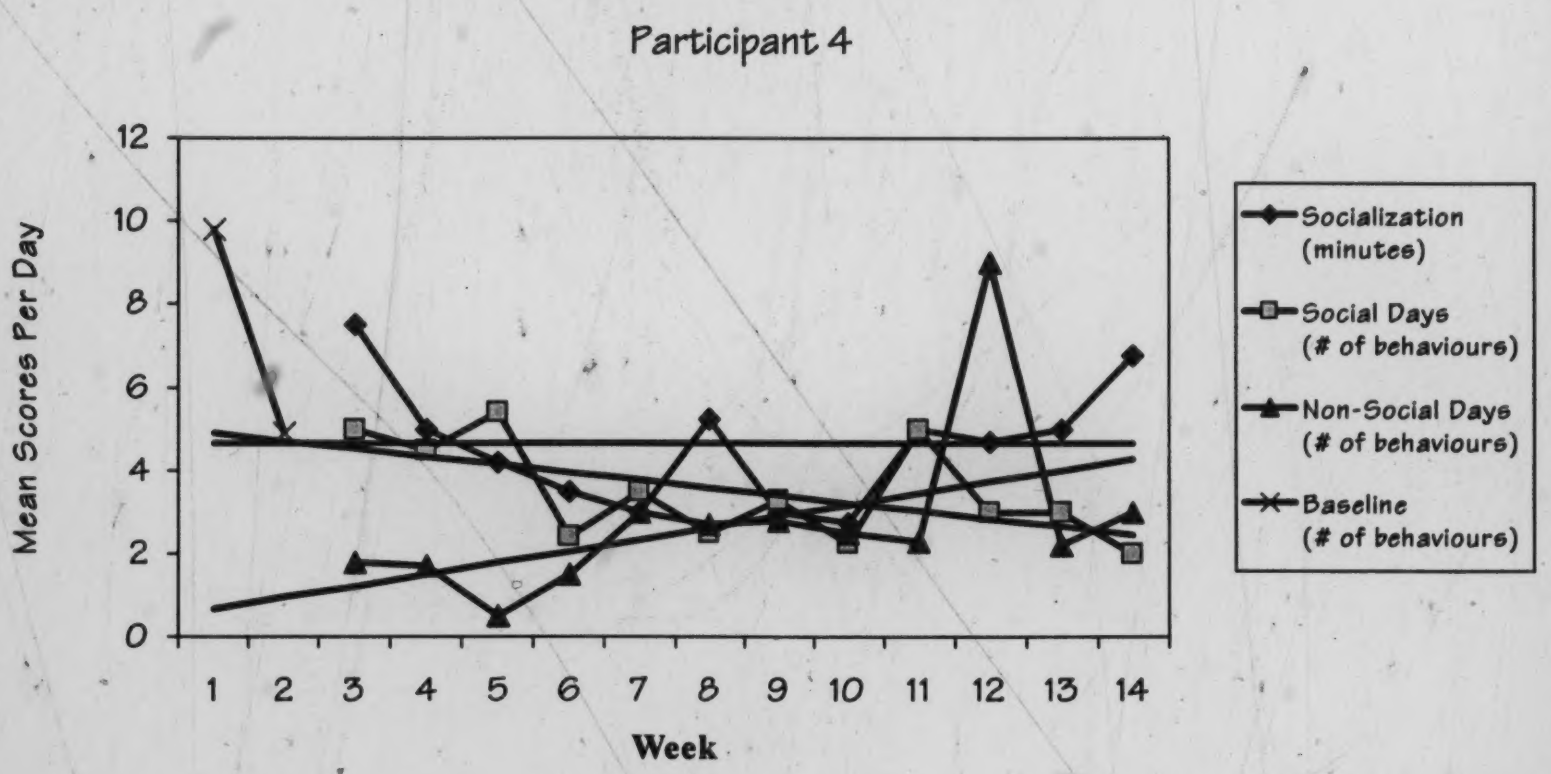
Weekly Total of Inappropriate Behaviours														
	Week													
	1 **	2	3 **	4	5 *	6 *	7 **	8	9 *	10 *	11 **	12 **	13	14 *
Unwarranted Crying	11	4	2	6	6	0	4	5	1	3	1	3	2	0
Unwarranted Requests	33	26	14	14	17	15	13	10	14	10	14	26	14	14
Verbally Abusive	2	1	2	3	3	0	0	1	2	1	0	0	0	0
Territorial	3	3	1	0	2	0	0	2	0	0	0	0	1	0
Total	49	34	19	23	28	15	17	18	17	14	15	29	17	14
Social Time	0	0	15	20	21	19	12	21	11	13	12	14	10	27

Note:

* one day of missing data

** two days of missing data

Figure 4. Mean # of Inappropriate Behaviours on Social and Non-Social Days and Mean Socialization Time Over 14 Weeks



Participant 5

This gentleman was 90 years old and joined the walking group on a regular basis and seemed to enjoy the camaraderie of the group. This individual was often seen with his coat and hat in hand, ready and willing to go for a walk either inside or outside and had a compliance rate of 88%. This participate was monitored for trying to leave the facility, territorial behaviour and repetitious mannerisms. The average number of inappropriate behaviours during week one of the two week baseline was 1.0 per day. During week two, this individual averaged 0.29 inappropriate behaviours per day. During week six and seven, this individual averaged 1.1 and 0.70 inappropriate behaviours per day, respectively. During the last two weeks of the study, this participant averaged 0.57 and 0.40 inappropriate behaviours per day. Although this person did not elicit many inappropriate behaviours prior to the start of the study, it was noticed that the frequency of these reported inappropriate behaviours decreased throughout the duration of the study.

Figure 5 illustrates that over the 14 week duration this individual's time spent walking increased slightly. This individual showed only slight decreases of inappropriate behaviours on walking days and non walking days due to their minimal frequency of behaviours prior to the start of the study.

Table 5

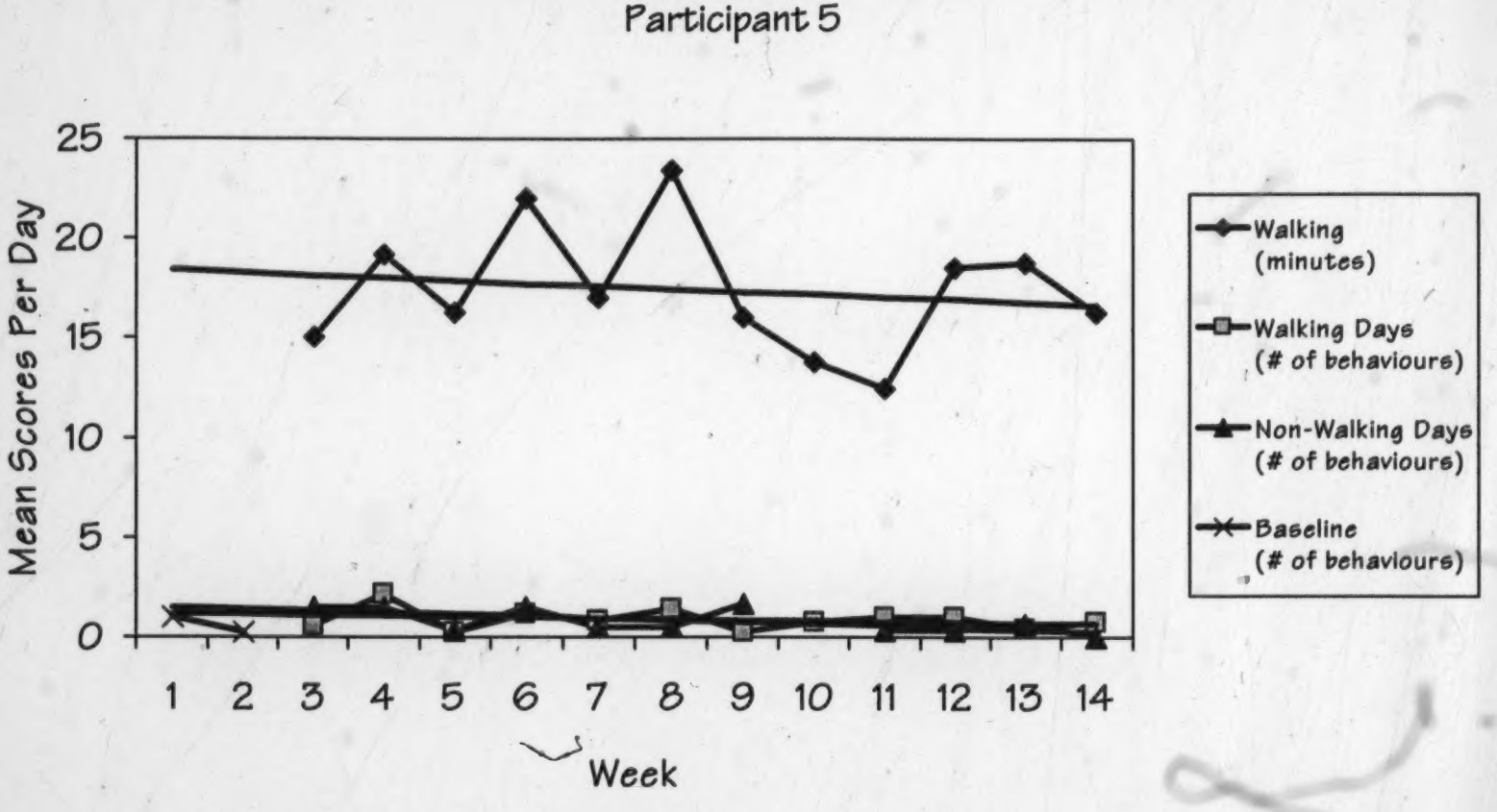
Weekly total of inappropriate behaviours for participant 5

Frequency of Inappropriate Behaviours														
	Week													
	1 *	2	3	4	5	6	7	8	9	10	11	12	13	14
Territorial	2	0	1	1	0	0	3	1	1	0	2	0	2	1
Trying to Leave Facility	0	1	2	2	0	2	0	0	0	0	0	0	0	0
Repetitious Mannerisms	4	1	3	11	2	6	2	7	5	3	3	5	2	2
Total	6	2	6	14	2	8	5	8	6	3	5	5	4	3
Walk Time	0	0	75	96	65	110	85	117	64	55	50	74	75	65

Note:

* one day of missing data

Figure 5. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 6

This 90 year old woman was frequently observed sleeping in a chair and often difficult to motivate to go for a walk. Although this participant was approached five days a week, her compliance rate was 20%. Most of these days took place in the first six weeks of the program, as there was no participation from this individual during the last six weeks of the study. This individual was monitored for disturbed sleep patterns, hoarding and verbal abusiveness. During the first and second week of the two week baseline, this individual averaged 10 and 10.9 inappropriate behaviours per day, respectively. During week six and week seven, this individual averaged 7.3 inappropriate behaviours per day. This participant discontinued her participation after week eight, therefore averages for the last two weeks of the program are not available. Hoarding requires an individual to be mobile in order to take and hide specific items, therefore this person's immobility may explain the drastic decrease in hoarding.

Figure 6 illustrates that over the 14 week duration this individual's time spent walking varied considerably. At week nine, this individual discontinued the walking program, however up to this point, this individual decreased their number of inappropriate behaviours consistently on walking days and non-walking days.

Table 6

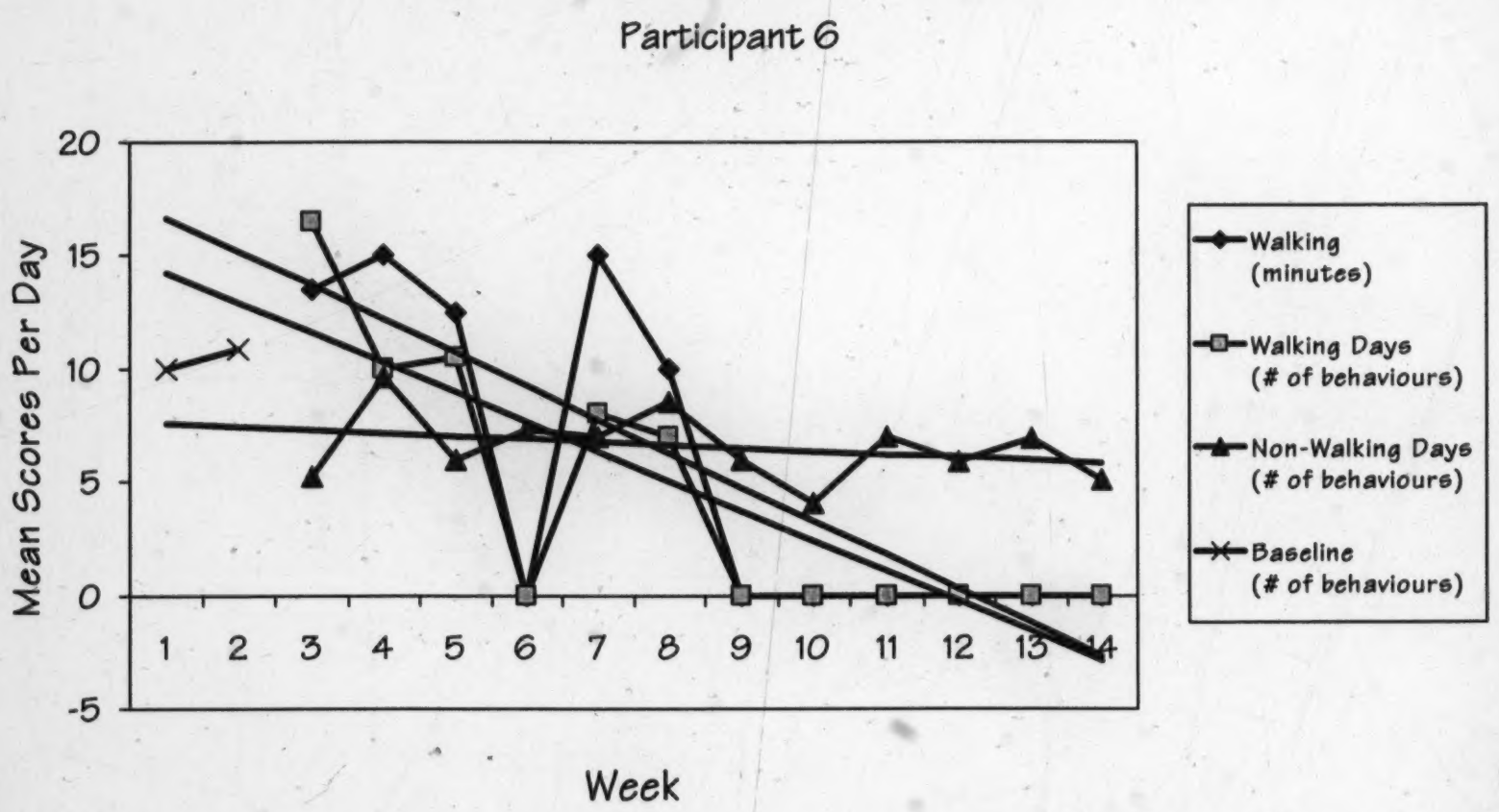
Weekly total of inappropriate behaviours for participant 6

Weekly Total of Inappropriate Behaviours														
	Week													
	1 *	2	3	4	5	6 *	7	8	9	10	11	12	13	14
Disturbed Sleep	51	53	45	55	43	42	44	50	41	29	47	38	46	34
Hoarding	8	22	14	12	8	1	7	7	1	0	2	2	2	2
Verbally Abusive	1	1	0	1	0	1	0	1	0	0	0	0	0	0
Total	60	76	59	68	51	44	51	58	42	29	49	40	40	36
Walk Time	0	0	27	30	25	0	30	10	0	0	0	0	0	0

Note:

* one day of missing data

Figure 6. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 7

This 91 year old male was always willing to go for a walk and seemed to enjoy the company. His compliance rate was 98%. He missed one day due to a facility field trip. This individual was being monitored for being verbally abusive, physically aggressive, displaying repetitious mannerisms and being territorial. Although there was not a great deal of change in terms of total inappropriate behaviours, it became obvious that the repetitive behaviour that was being recorded most often was related to this gentleman's humming. Humming appeared to be a calming mechanism for this gentleman. The average number of inappropriate behaviours per day during week one and week two during the two week baseline were 7.5 and 5.9, respectively. During week six, the average number of inappropriate behaviours was 4.0 and during week seven the average number of inappropriate behaviours was 7.7. At week 13 and week 14, the average number of inappropriate behaviours per day decreased to 6.1 and 5.3, respectively. Overall, this individual decreased his inappropriate behaviours by 15%.

Figure 7 illustrates that over the 14 week duration this individual's time spent walking gradually increased. On walking days this individual gradually decreased their number of inappropriate behaviours. On non-walking days, this individual's number of inappropriate behaviours varied week to week and showed few changes.

Table 7

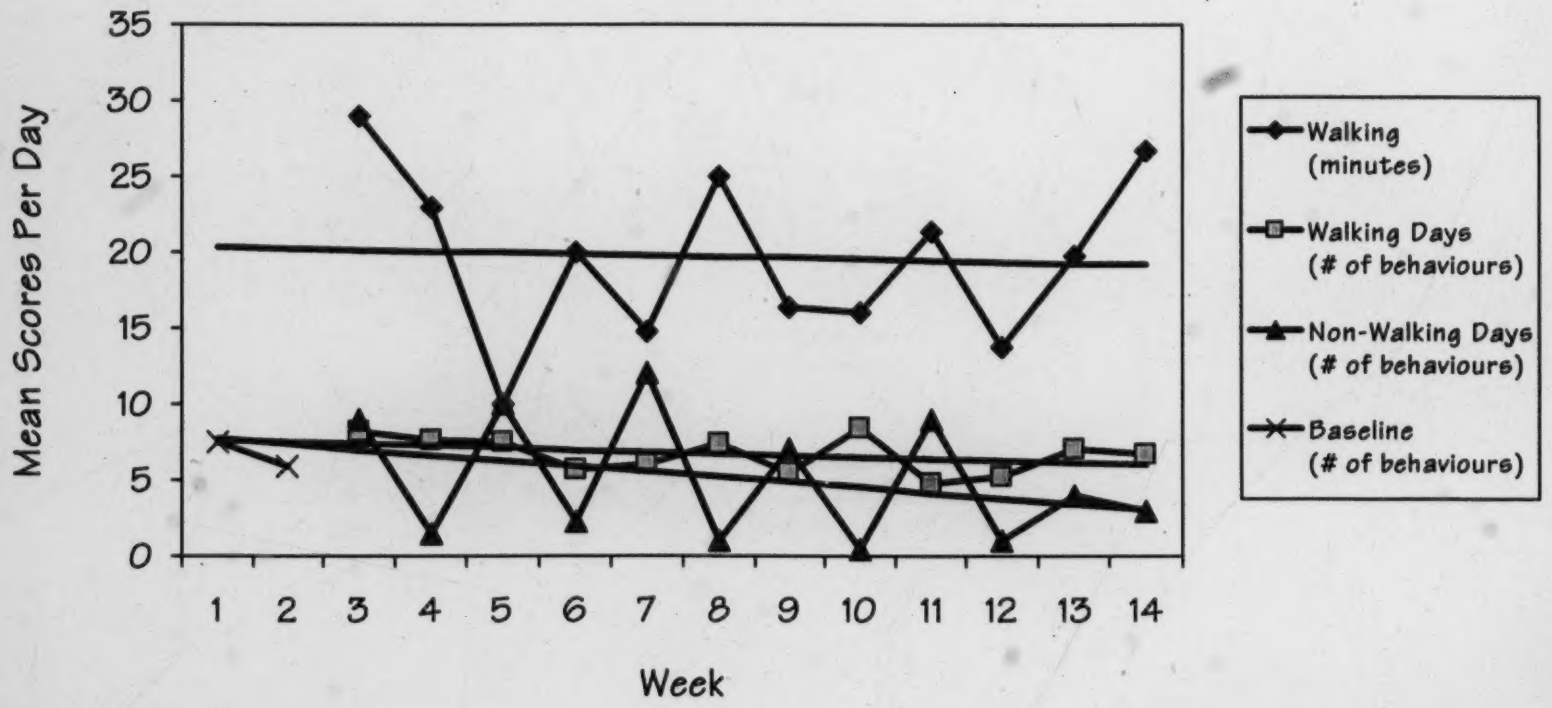
Weekly total of inappropriate behaviours for participant 7

Weekly Totals of Inappropriate Behaviours														
	Week													
	1 *	2	3	4	5	6 *	7	8	9	10	11	12	13	14
Verbally Abusive	1	0	2	3	5	1	2	4	2	4	3	0	2	0
Physically Aggressive	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Repetitious Mannerisms	42	37	45	38	54	23	52	35	38	39	39	22	38	37
Territorial	2	1	12	0	1	0	0	0	0	0	0	2	3	0
Total	45	41	59	41	60	24	54	39	41	43	42	24	43	37
Walk Time	0	0	145	115	40	100	74	125	82	80	107	55	99	107

Note:

* one day of missing data

Figure 7. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 8

This 86 year old woman enjoyed the company of a particular resident, and would only go for a walk if this resident accompanied her. Together, the participant in the walking study and her friend joined the walking group on a regular basis, having a compliance rate of 85%. Both appeared to enjoy the company of the walking technician. This participant was being monitored for seeking attention, disturbed sleep patterns, hoarding, and layering. During the first and second week of the two week baseline, this individual averaged 8.8 and 9.0 inappropriate behaviours per day, respectively. The average number of inappropriate behaviours per day during week six and week seven were 7.3 and 11.1, respectively. During week 13 and week 14, this individual averaged 6.0 and 9.9 inappropriate behaviours per day, respectively. Overall, this participant did not decrease their inappropriate behaviours, however, their time spent walking each week progressively increased throughout the duration of the study.

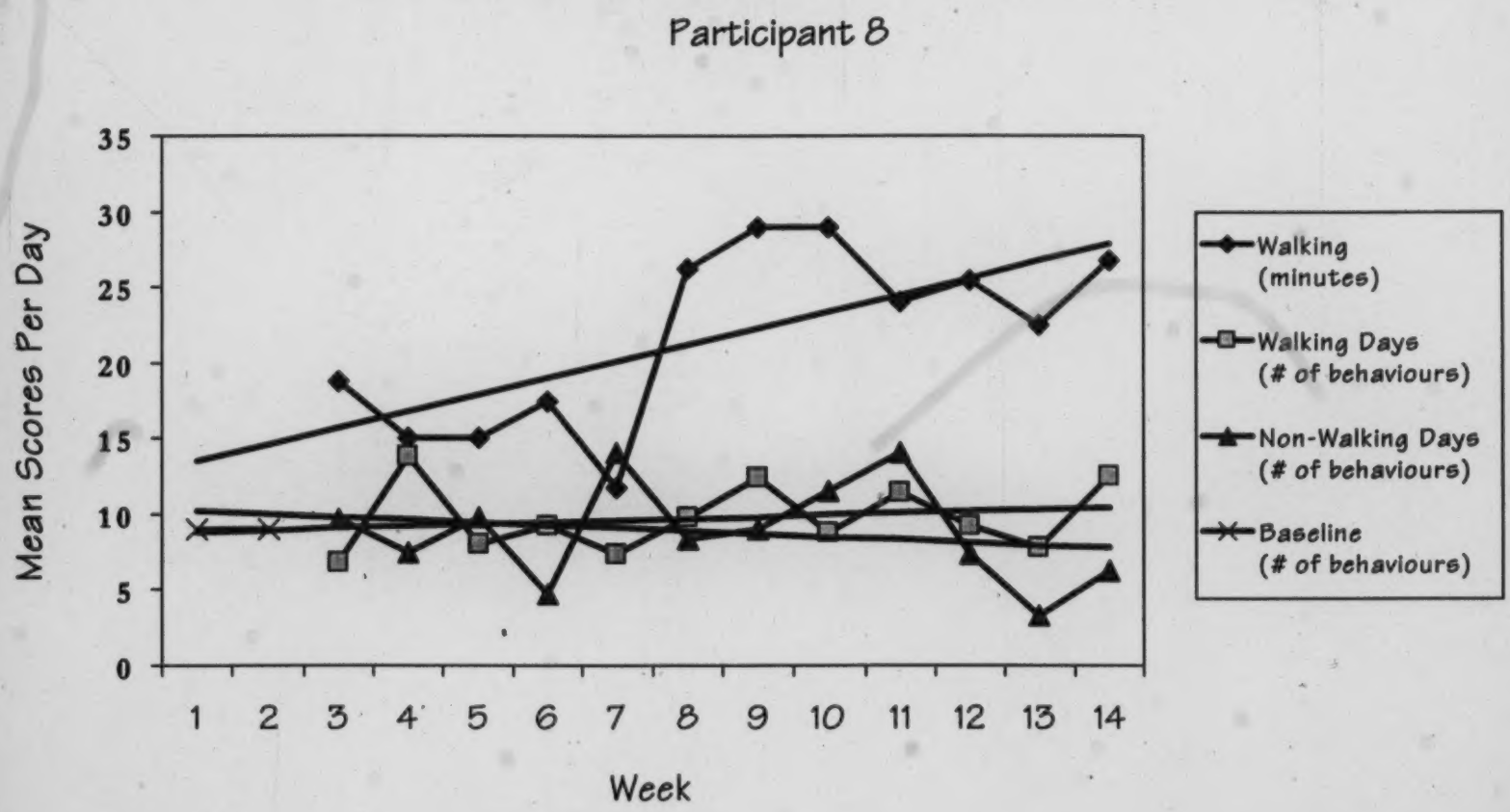
Figure 8 illustrates that over the 14 week duration this individual's time spent walking increased considerably. On walking days, this individual showed few decreases with respect to inappropriate behaviours. On non-walking days this individual's number of inappropriate behaviours varied week to week and showed few changes.

Table 8

Weekly total of inappropriate behaviours for participant 8

Weekly Totals of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Seeking Attention	33	42	42	57	35	32	44	37	53	39	61	38	22	43
Disturbed Sleep	5	4	0	4	1	4	3	7	0	3	0	0	0	1
Hoarding	12	7	7	15	10	9	17	13	18	16	16	12	12	18
Layering	12	10	7	8	9	6	14	7	9	9	8	7	8	7
Total	62	63	56	84	55	51	78	64	80	67	85	57	42	69
Walk Time	0	0	75	7 5	30	70	35	1 05	145	145	120	102	90	107

Figure 8. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 9

This 85 year old gentleman was active in the walking group during weeks three, four and five of the study, but then suddenly refused to go for anymore walks. In total, this individual had a compliance rate of 20%. He was approached daily, even though his >no' response was predictable. He would often ask how the 'walking program' was going, but did not want to participate. The inappropriate behaviours that this person was monitored for included disturbed sleep, trying to leave facility, territorial behaviours, and being a loner. The average number of inappropriate behaviours displayed per day by this individual during week one and week two were 10.0 and 4.4, respectively. By week six, this individual had chosen to discontinue their participation, therefore it is difficult to make any sound conclusions.

Figure 9 illustrates that over the 14 week duration this individual's time spent walking varied considerably. By week eight, this person had discontinued with the walking program. On walking days, this individual showed increases with respect to inappropriate behaviours. On non-walking days, this individual's number of inappropriate behaviours decreased over time.

Table 9

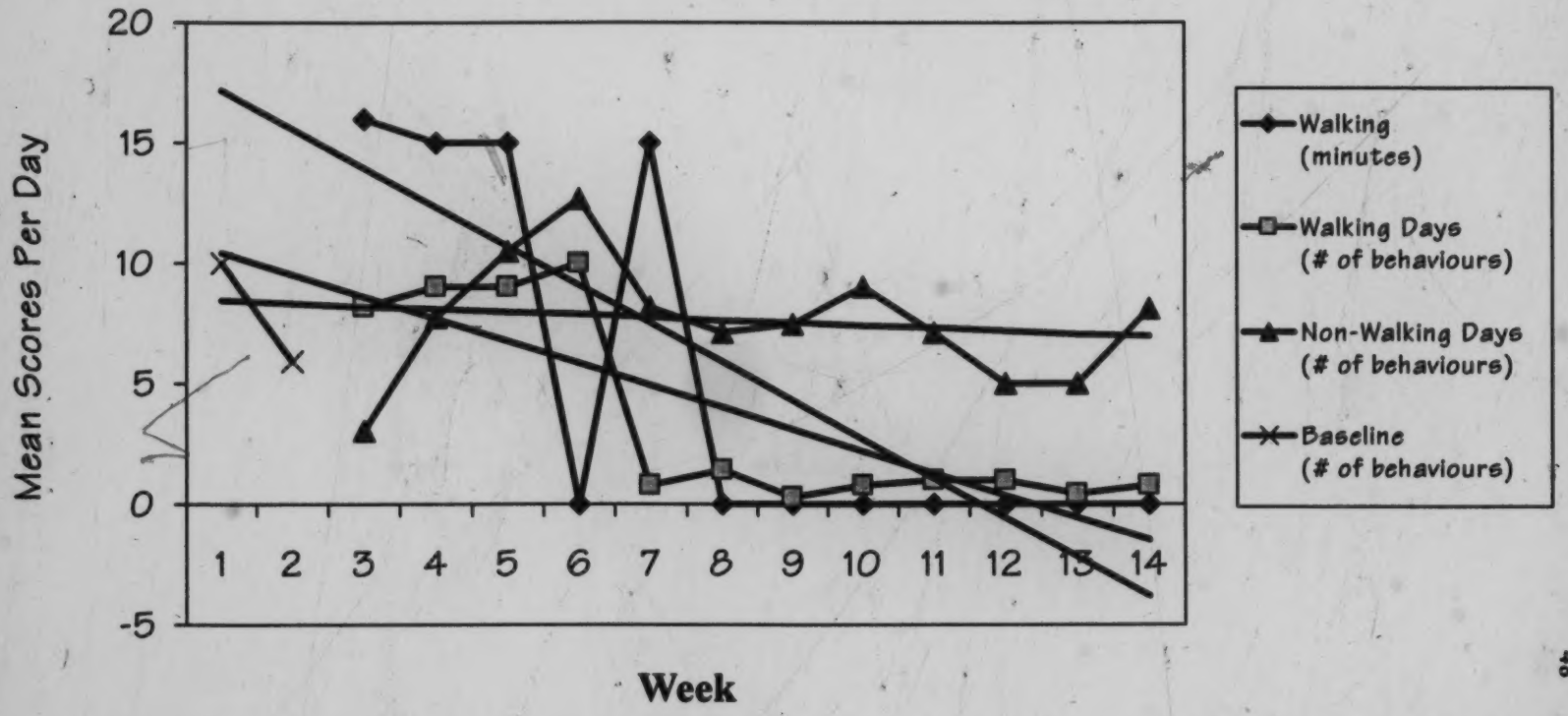
Weekly total of inappropriate behaviours for participant 9

Weekly Totals of Inappropriate Behaviours														
	Week													
	1 *	2	3	4	5	6 *	7	8	9	10	11	12	13	14
Disturbed Sleep	19	4	12	17	16	25	22	15	17	27	10	16	15	23
Trying to Leave Facility	13	8	12	12	12	18	8	6	5	9	5	6	9	8
Territorial	1	1	0	0	0	0	1	0	0	1	0	0	0	2
Loner	27	18	23	29	36	33	20	29	23	26	35	13	11	24
Total	60	31	47	58	64	76	51	50	45	63	50	35	35	57
Walk Time	0	0	80	45	45	0	0	0	0	0	0	0	0	0

Note:

* one day of missing data

Figure 9. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 10

This active 84 year old female was often willing to go for a walk and enjoyed the camaraderie of the group. Her compliance rate was 72%. This individual was monitored for displaying verbal abusiveness, trying to leave the facility, and layering. The average number of inappropriate behaviours per day during the two week baseline were 4.0 during week one and 4.8 during week two. During week six and seven, the average number of inappropriate behaviours per day were 2.7 and 4.0. At week 13 and week 14, the average number of inappropriate behaviours displayed per day were 2.3 and 2.3. Overall, this individual decreased their frequency of inappropriate behaviours by 48%.

Figure 10 illustrates that over the 14 week duration this individual's time spent walking decreased slightly. On walking days, this individual showed decreases with respect to inappropriate behaviours and on non-walking days, this individual's number of inappropriate behaviours showed few changes.

Table 10

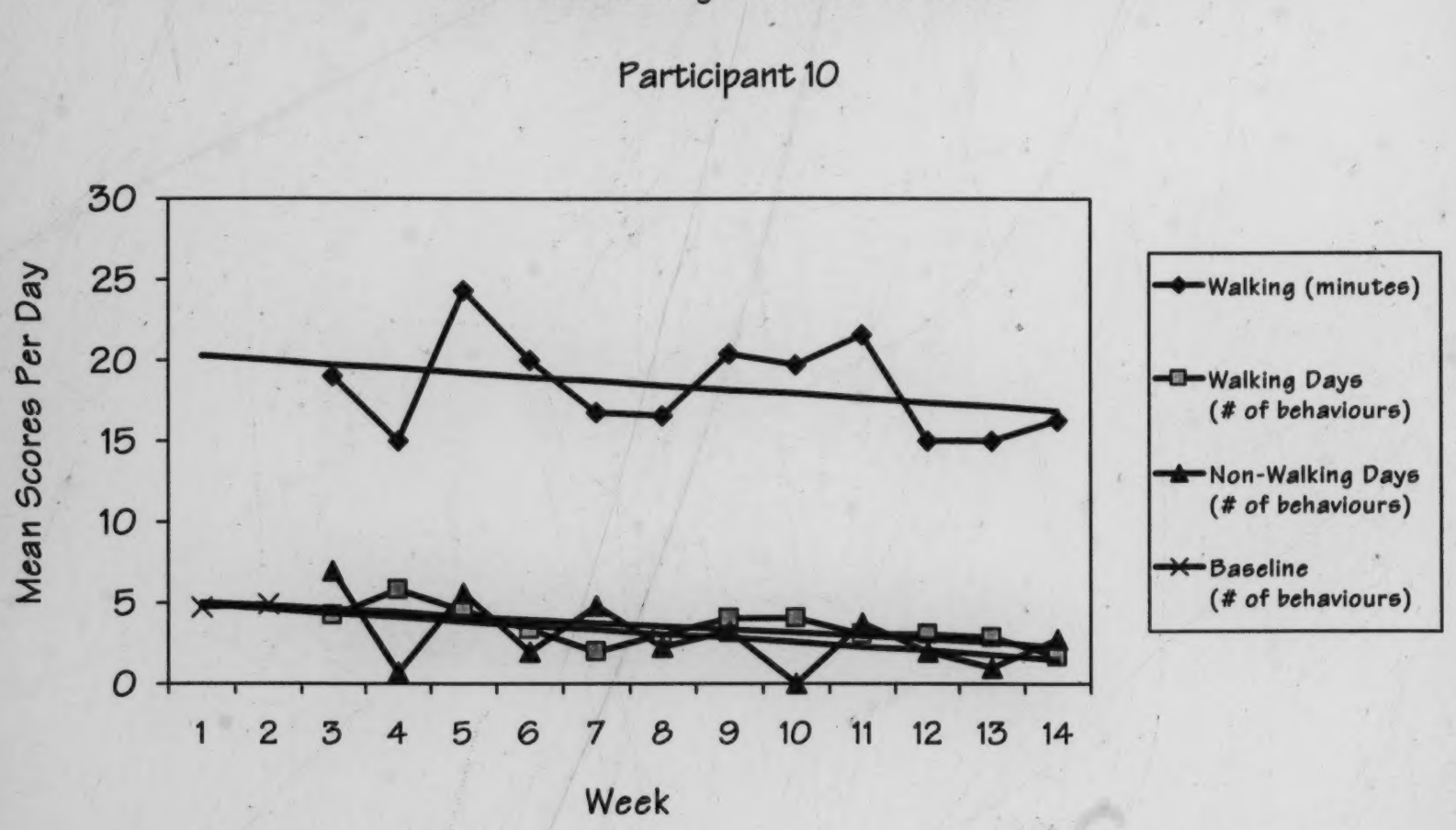
Weekly total of inappropriate behaviours for participant 10

Weekly Totals of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6 *	7	8	9	10	11	12	13	14
Verbally Abusive	6	10	8	4	6	1	4	2	0	2	4	2	1	1
Trying to Leave Facility	8	10	9	4	8	4	3	3	3	1	2	2	1	2
Layering	14	14	18	17	23	11	21	14	22	17	18	13	14	13
Total	28	34	35	25	37	16	28	19	25	20	24	17	16	16
Walk Time	0	0	140	76	30	73	40	67	50	102	59	65	75	45

Note:

* one day of missing data

Figure 10. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 11

This 81 year male had a compliance rate of 80% and was monitored for verbal abusiveness, disturbed sleep patterns, and being a loner. This participant exhibited an average of 2.0 and 1.4 inappropriate behaviours per day during week one and week two, respectively. During week six and week seven, this individual averaged 3.0 and 3.4 inappropriate behaviours per day. At week 13 and week 14 this individual decreased their average number of inappropriate behaviours per day to 1.7 and 1.1, respectively. It is difficult to form conclusions because this individual did not display many inappropriate behaviours prior to the study, however it is promising to observe that the frequency and time spent walking increased consistently.

Figure 11 illustrates that over the 14 week duration this individual's time spent walking increased gradually. On walking days, this individual showed substantial decreases with respect to inappropriate behaviours and on non-walking days, this individual's number of inappropriate behaviours increased.

Table 11

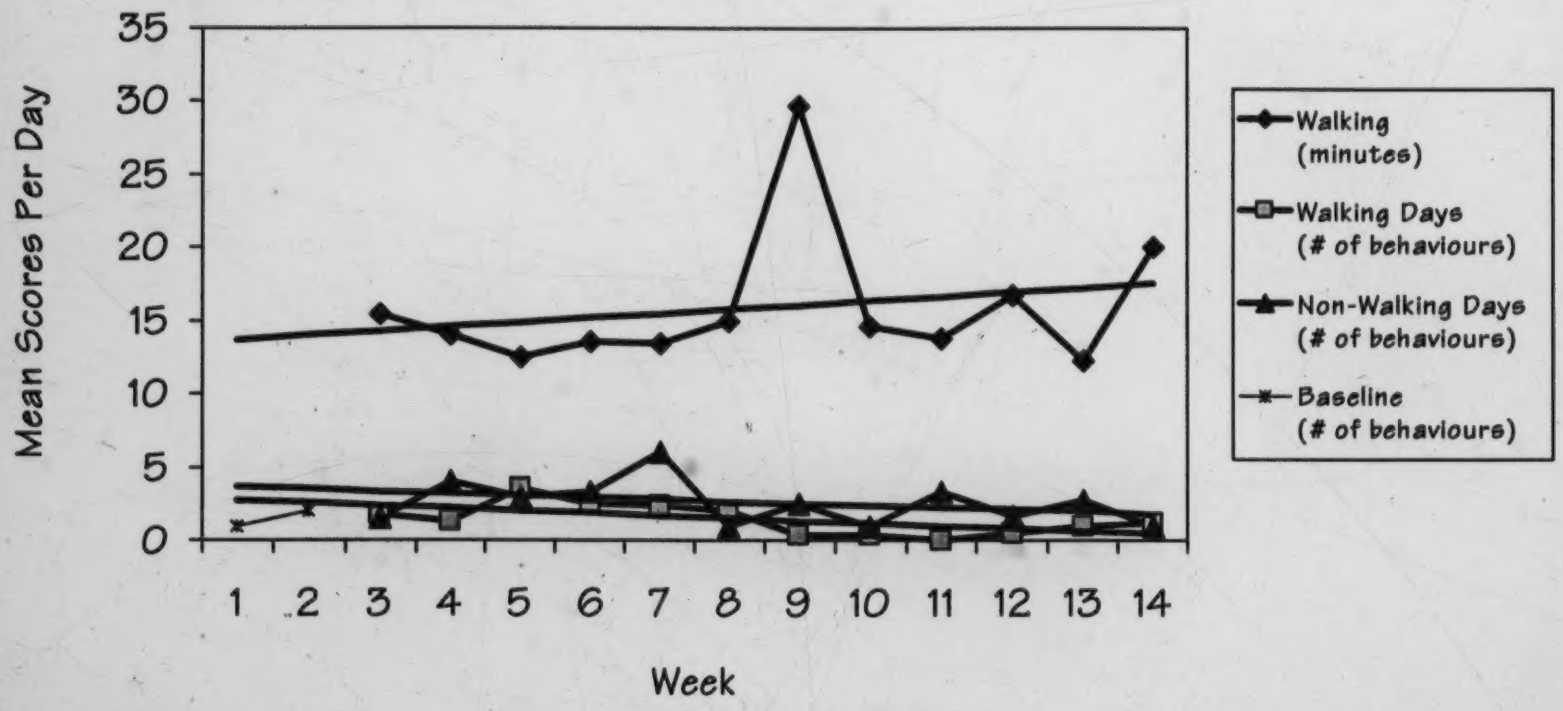
Weekly total of inappropriate behaviours for participant 11

Weekly Totals of Inappropriate Behaviours														
	Week													
	1 *	2	3	4	5	6 *	7	8	9	10	11	12	13	14
Verbally Abusive	1	3	3	1	6	1	10	2	5	0	3	1	5	3
Disturbed Sleep	3	0	1	4	1	9	8	5	5	0	2	2	7	5
Loner	8	7	8	15	15	8	6	4	1	5	5	4	0	0
Total	12	10	12	20	22	18	24	11	11	4	10	7	12	8
Walk Time	0	0	77	42	25	37	37	60	89	44	55	67	49	100

Note:

* one day of missing data

Figure 11. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 12

This 90 year old woman had a very erratic compliance rate of 40%. This individual was monitored for unwarranted crying and hoarding, however the frequency of inappropriate behaviours per day were minimal. During the first two weeks of the study, the average number of inappropriate behaviours per day were 0.14 and 0.29, respectively. At mid point, this individual averaged 0.14 inappropriate behaviours per day during week six and 0.43 behaviours per day during week seven. During the last two weeks of the walking study this individual averaged 0 behaviours per day during week 13 and 0.14 behaviours per day for week 14. With such small numbers, it was very difficult to warrant any sound conclusions.

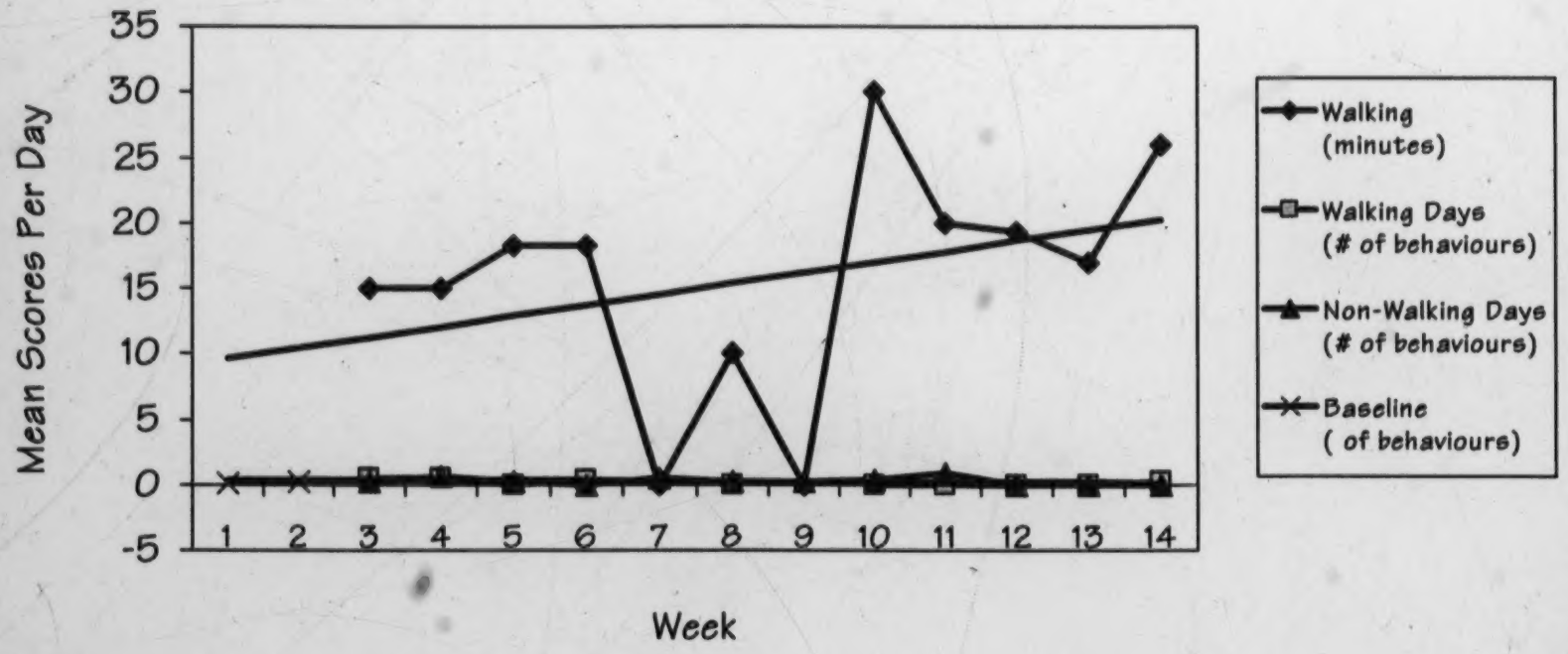
Figure 12 illustrates that over the 14 week duration this individual's time spent walking varied considerably. Trends from the graph are not evident because few behaviours were present prior to the start of the study.

Table 12

Weekly total of inappropriate behaviours for participant 12

Weekly Totals of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Unwarranted Crying	1	0	0	2	1	1	1	1	0	1	1	0	0	1
Hoarding	0	2	2	2	0	0	2	0	1	1	4	0	0	0
Total	1	2	2	4	1	1	3	1	1	2	5	0	0	1
Walk Time	0	0	30	30	25	56	0	10	0	0	20	58	17	130

Figure 12. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 13

This 81 year old woman had a very high compliance rate of 87% and showed increases with respect to time spent walking as the walking program progressed. This participant was monitored for verbal abusiveness, unwarranted crying, hoarding, seeking attention and going into others rooms. The average number of inappropriate behaviours during the two week baseline was 5.9 behaviours during week one and 7.4 behaviours during week two. At week six, the average number of inappropriate behaviours per day was 9.1 and 4.7 during week seven. During the final two weeks of the walking study, this individual decreased their inappropriate behaviours per day to 4.5 during week 13 and 4.3 during week 14, representing an overall decrease of 34%.

Figure 13 illustrates that over the 14 week duration this individual's time spent walking consistently increased. On walking days, this individual showed decreases with respect to inappropriate behaviours and on non-walking days, this individual's number of inappropriate behaviours slight increases.

Table 13

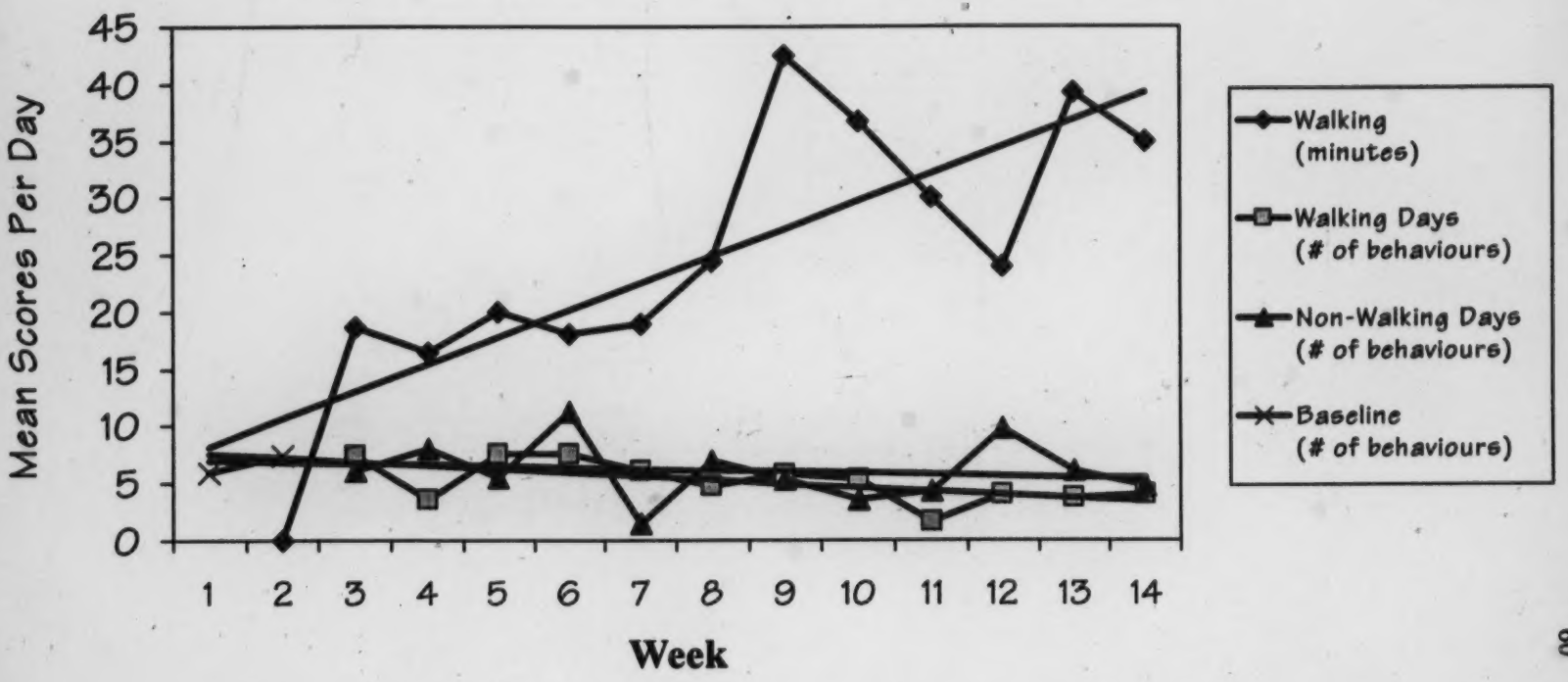
Weekly total of inappropriate behaviours for participant 13

Weekly Totals of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13 *	14
Verbally Abusive	9	9	7	7	7	8	8	13	5	9	7	3	4	5
Unwarranted Crying	16	17	10	17	9	20	14	15	22	12	9	16	10	8
Hoarding	3	7	13	2	21	18	6	3	3	5	2	8	3	4
Seeking Attention	10	10	13	6	11	18	4	2	9	3	3	23	10	12
Going into other's Rooms	3	9	6	2	1	0	1	5	0	1	0	1	0	1
Total	41	52	49	34	49	64	33	38	39	30	21	51	27	30
Walk Time	0	0	93	82	100	72	95	122	170	110	90	72	92	140

Note:

* one day of missing data

Figure 13. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 14

This 88 year old woman was an eager and consistent participant and had a compliance rate of 100%. She was monitored for trying to leave the facility, unwarranted requests and repetitious mannerisms. The average number of inappropriate behaviours per day during the two week baseline, were 8.4 during week one and 8.0 during week two. During week six and week seven, the average number of inappropriate behaviours per day were 4.4 and 8.7, respectively. During the last two weeks of the study, this individual averaged 4.3 and 3.1 inappropriate behaviours per day. Overall, this individual decreased her inappropriate behaviours by 55% and consistently increased her time spent walking each week.

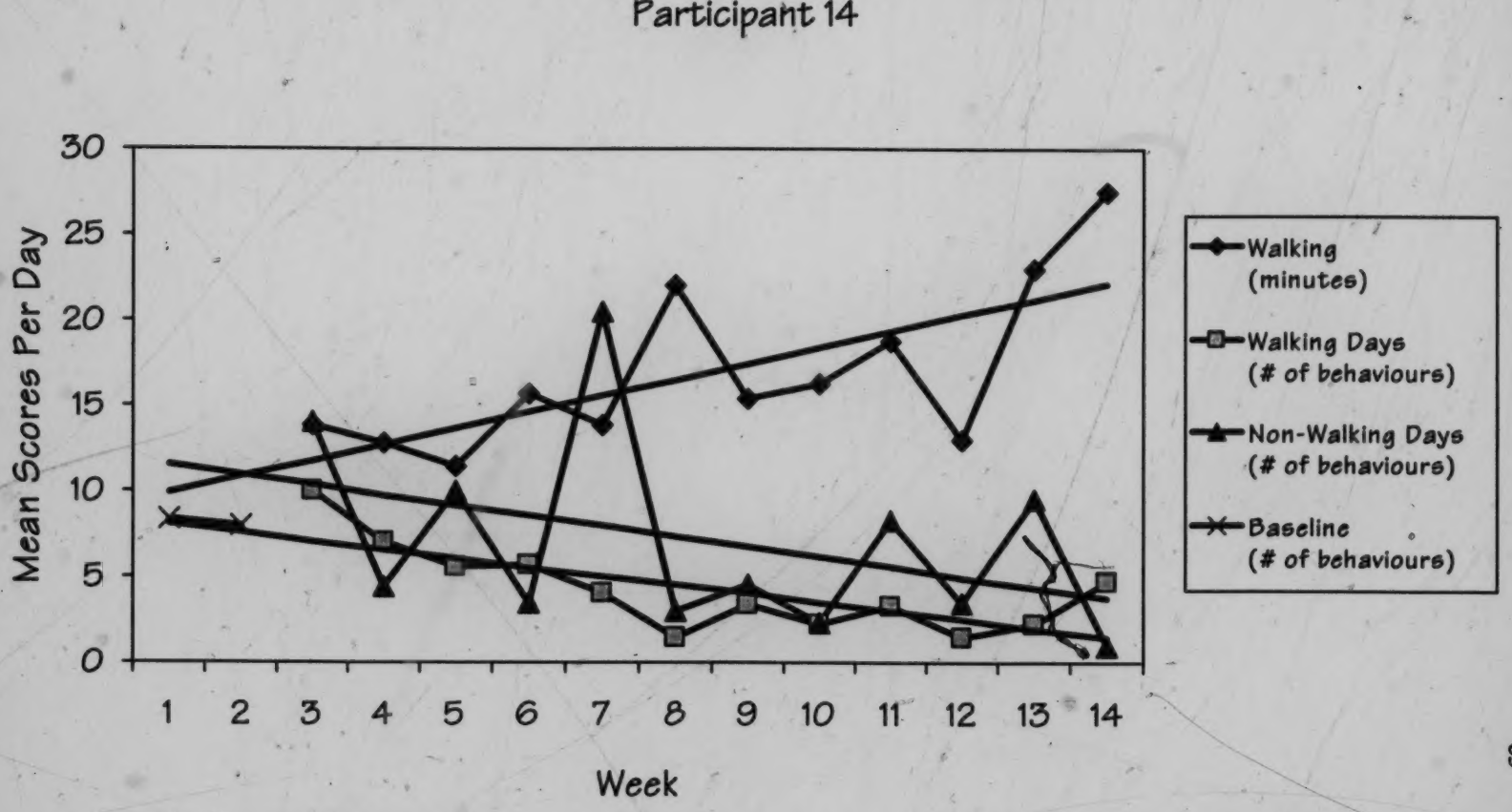
Figure 14 illustrates that over the 14 week duration this individual's time spent walking consistently increased. On walking days, this individual showed decreases with respect to inappropriate behaviours and on non-walking days, this individual's number of inappropriate behaviours showed few changes.

Table 14

Weekly total of inappropriate behaviours for participant 14

Weekly Totals of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Trying to Leave Facility	24	14	28	5	13	15	27	9	14	4	15	3	7	9
Unwarranted Requests	15	11	10	2	10	1	18	1	5	2	6	6	13	4
Repetitious Mannerisms	20	31	40	29	25	15	16	3	7	18	17	5	10	9
Total	59	56	78	36	48	31	61	13	26	16	38	14	30	22
Walk Time	0	0	69	64	57	47	69	110	77	65	75	65	115	110

Figure 14. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 15

This 99 year old male had a compliance rate of 89%, however, he required a great deal of one- on- one with the walking technician because he was easily distracted and agitated by others. Unfortunately, this individual was transferred to another facility during the week 14 of the study, therefore week 12 and week 13 will be included instead. The inappropriate behaviours this individual was monitored for included going into others rooms, disturbed sleep patterns, physical aggressiveness and verbal abusiveness. The average number of inappropriate behaviours per day during week one of the two week baseline was 20.4 followed by 19.7 behaviours per day for week two. The average number of inappropriate behaviours during week 6 and 7 were 14.3 and 19.6, respectively. By week 12 and week 13, the average number of inappropriate behaviours exhibited per day were 16.7 and 11.0. Overall, this individual decreased their inappropriate behaviours by 31%.

Figure 15 illustrates that over the 14 week duration this individual's time spent walking consistently increased until week 10, at which time it decreased until week 13. On both walking and non-walking days, this individual showed increases with respect to inappropriate behaviours followed by gradual decreases during weeks 11-13.

Figure 15

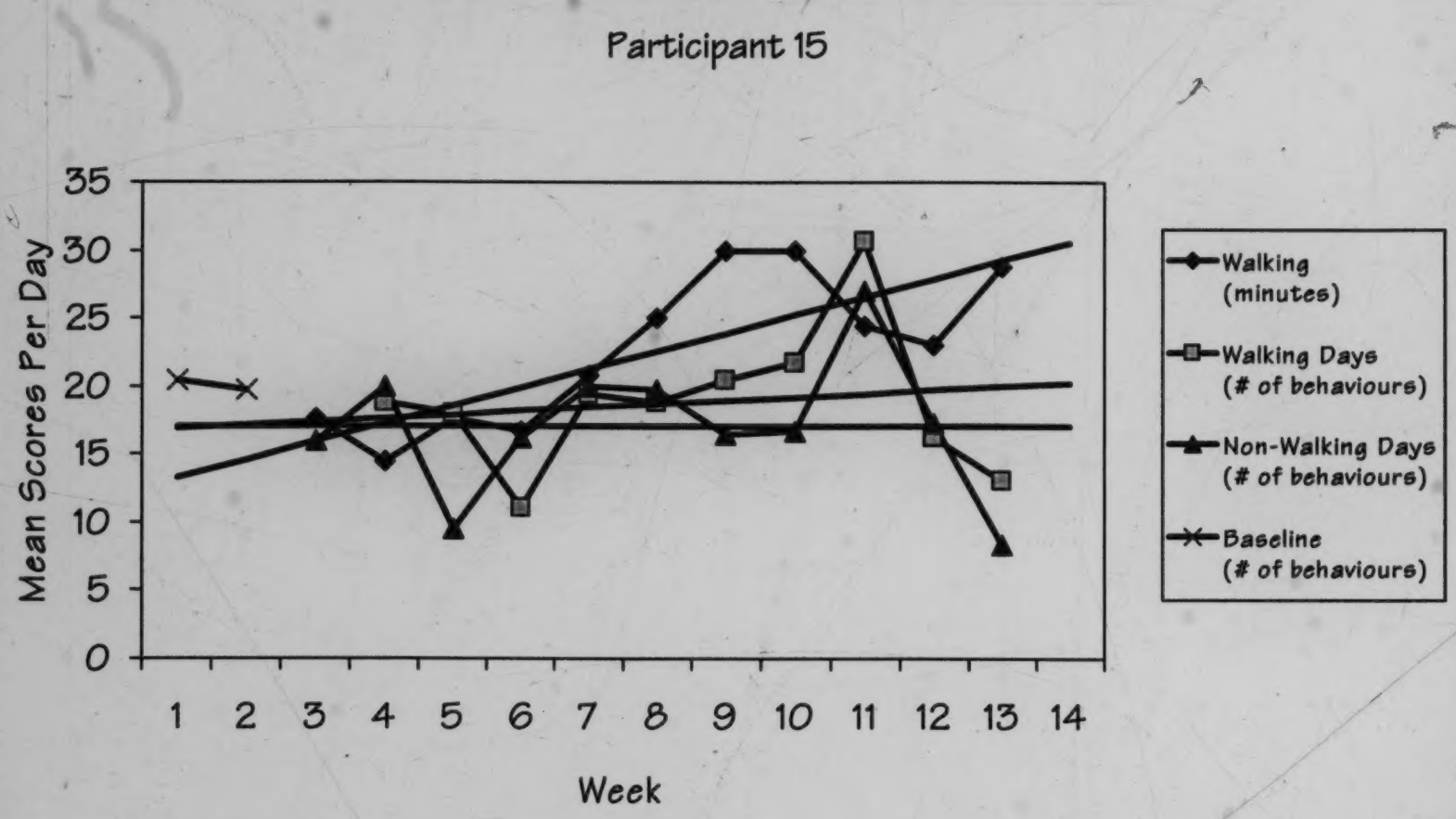
Weekly total of inappropriate behaviours for participant 15

Weekly Totals of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Going into other's Rooms	77	53	59	54	44	31	42	47	51	49	106	52	25	n/a
Disturbed Sleep	35	44	46	50	55	47	64	53	57	42	48	47	32	n/a
Physically Aggressive	20	21	11	18	9	12	16	18	16	21	28	11	13	n/a
Verbally Abusive	11	20	6	12	1	10	15	16	11	25	25	7	7	n/a
Total	143	138	122	134	109	100	137	134	135	137	207	117	77	n/a
Walk Time	0	0	88	72	88	50	104	100	150	120	122	92	115	n/a

Note:

n/a no data available

Figure 15. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 16

This 89 year old female had a high compliance rate of 87% to the walking program and increased her time spent walking as the program progressed. This individual was monitored for verbal abusiveness, seeking attention, layering, unwarranted requests and territorial behaviour. The average number of inappropriate behaviours during week one and week two of the two week baseline was 20.6 and 23.7, respectively. During mid point of the study, the average number of inappropriate behaviours displayed per day were 28.4 during week six and 15.4 during week seven. During the last two weeks of the walking study, this individual decreased her inappropriate behaviours to 16 .0 during week 13 and 9.9 during week 14. Overall, this individual decreased their inappropriate behaviours by 62%.

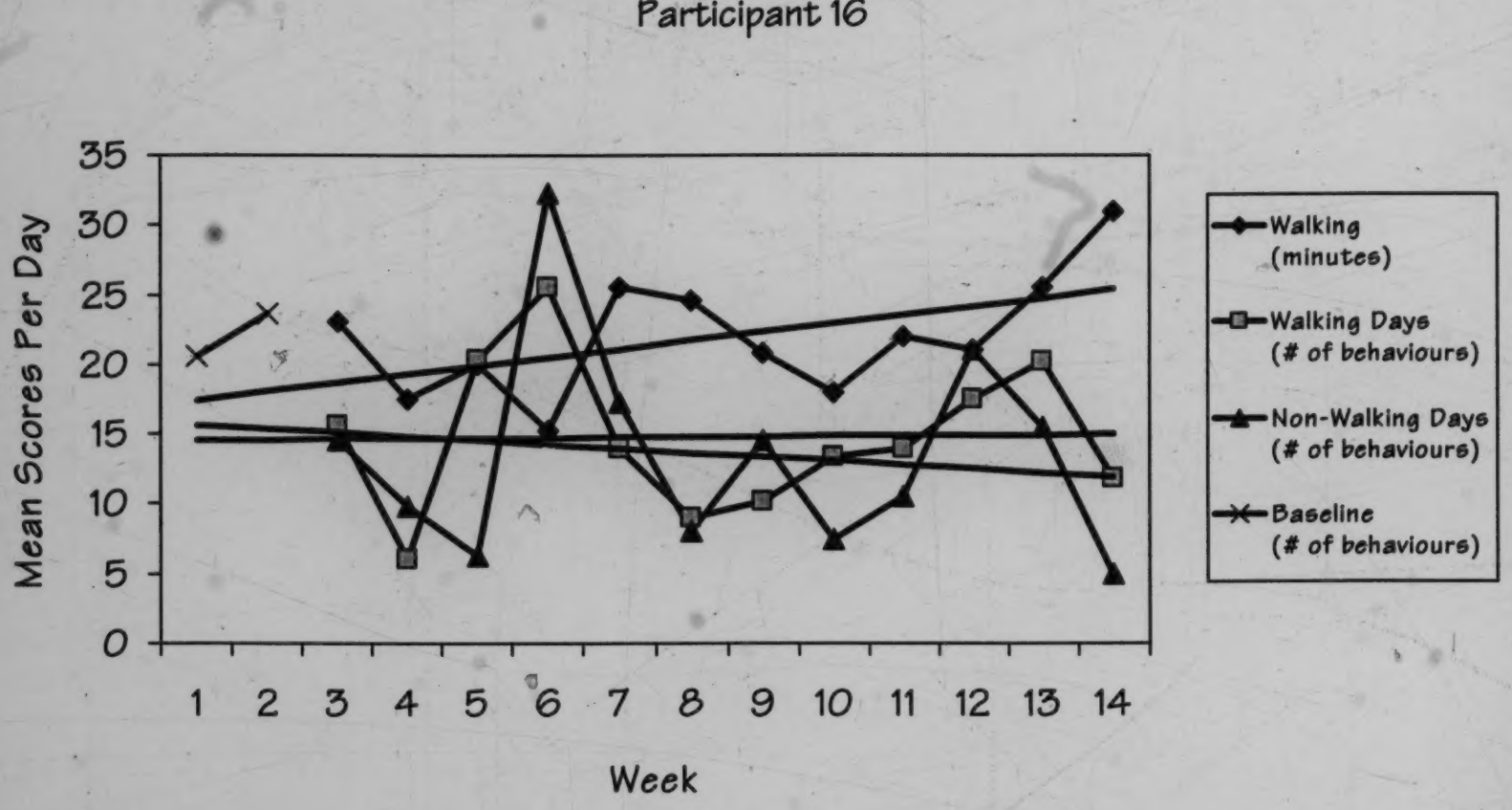
Figure 16 illustrates that over the 14 week duration this individual's time spent walking consistently increased. On walking days, this individual showed slight decreases with respect to inappropriate behaviours. On non-walking days the number of inappropriate behaviours varied considerably.

Table 16

Weekly total of inappropriate behaviours for participant 16

Weekly Totals of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Verbally Abusive	11	9	17	6	6	7	0	1	0	1	0	0	0	1
Seeking Attention	51	72	33	17	32	55	33	14	22	35	38	49	60	35
Layering	21	12	17	21	17	91	60	38	48	40	40	41	41	18
Unwarranted Requests	22	33	25	9	17	34	11	8	10	4	11	21	10	8
Territorial	39	40	15	8	14	12	4	0	0	2	2	1	1	7
Total	144	166	107	61	86	199	108	61	80	82	91	112	112	69
Walk Time	0	0	115	35	60	61	102	123	104	90	110	84	102	155

Figure 16. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 17

This 83 year old participant was an avid walker amongst the group and had a compliance rate of 75%. Her time spent walking progressed steadily as the walking program advanced. She was being monitored for disturbed sleep patterns, verbal abusiveness, unwarranted requests, seeking attention and territorial behaviour. The average number of inappropriate behaviours displayed per day during the two week baseline was 19.9 during week one and 21.6 during week two. At mid point, this individual averaged 32.0 inappropriate behaviours per day during week six and 15.9 behaviours per day during week seven. During the last two weeks of the walking study, this individual displayed an average of 21.6 behaviours per day during week 13 and 16.3 behaviours per day during week 14. Overall, her average number of inappropriate behaviours did decrease, but only by 8.7%.

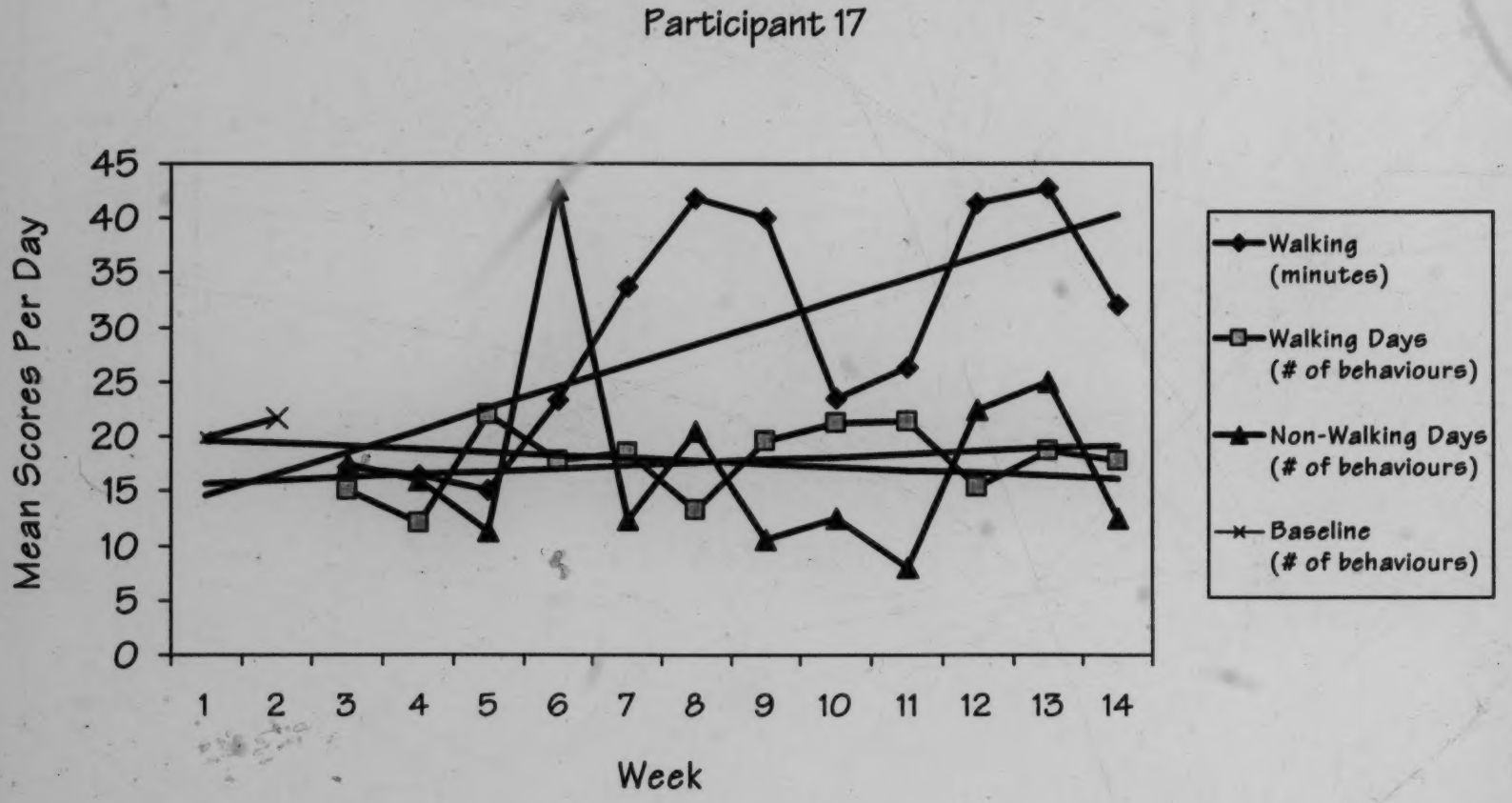
Figure 17 illustrates that over the 14 week duration this individual's time spent walking consistently increased. On walking days, this individual showed very little change with respect to the number of inappropriate behaviours displayed. On non-walking days the number of inappropriate behaviours increased slightly.

Table 17

Weekly total of inappropriate behaviours for participant 17

Weekly Totals of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Disturbed Sleep	35	61	43	39	26	50	20	22	27	29	16	41	34	22
Verbally Abusive	6	15	8	1	6	3	1	3	9	1	1	1	8	1
Unwarranted Requests	35	10	10	8	15	62	24	14	11	13	26	7	20	24
Seeking Attention	62	58	45	53	61	109	66	68	71	67	80	68	86	66
Territorial	1	7	4	1	3	0	0	0	1	0	0	5	3	1
Total	139	151	110	102	111	224	111	107	119	110	123	122	151	114
Walk Time	0	0	86	82	53	70	135	209	200	119	132	207	214	160

Figure 17. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Participant 18

This 82 year old woman was a consistent participant in the walking group with a compliance rate of 63% and whose length of time spent walking increased throughout the duration of the study. This individual was monitored for layering, verbal abusiveness, going into other's rooms and disturbed sleep patterns. The average number of inappropriate behaviours displayed per day during the two week baseline were 11.6 behaviours during week one and 11.3 during week two. At mid point, the average number of inappropriate behaviours per day were 14.0 during week six and 9.1 during week seven. During the last two weeks of the study, the average number of inappropriate behaviours per day displayed by this individual were 3.5 and 4.0, respectively. Overall, this person decreased their frequency of inappropriate behaviours by 67%.

Figure 18 illustrates that over the 14 week duration this individual's time spent walking consistently increased, with the exception of week six. On walking days, this individual consistently decreased their number of inappropriate behaviours. On non-walking days the number of inappropriate behaviours also decreased.

Table 18

Weekly total of inappropriate behaviours for participant 18

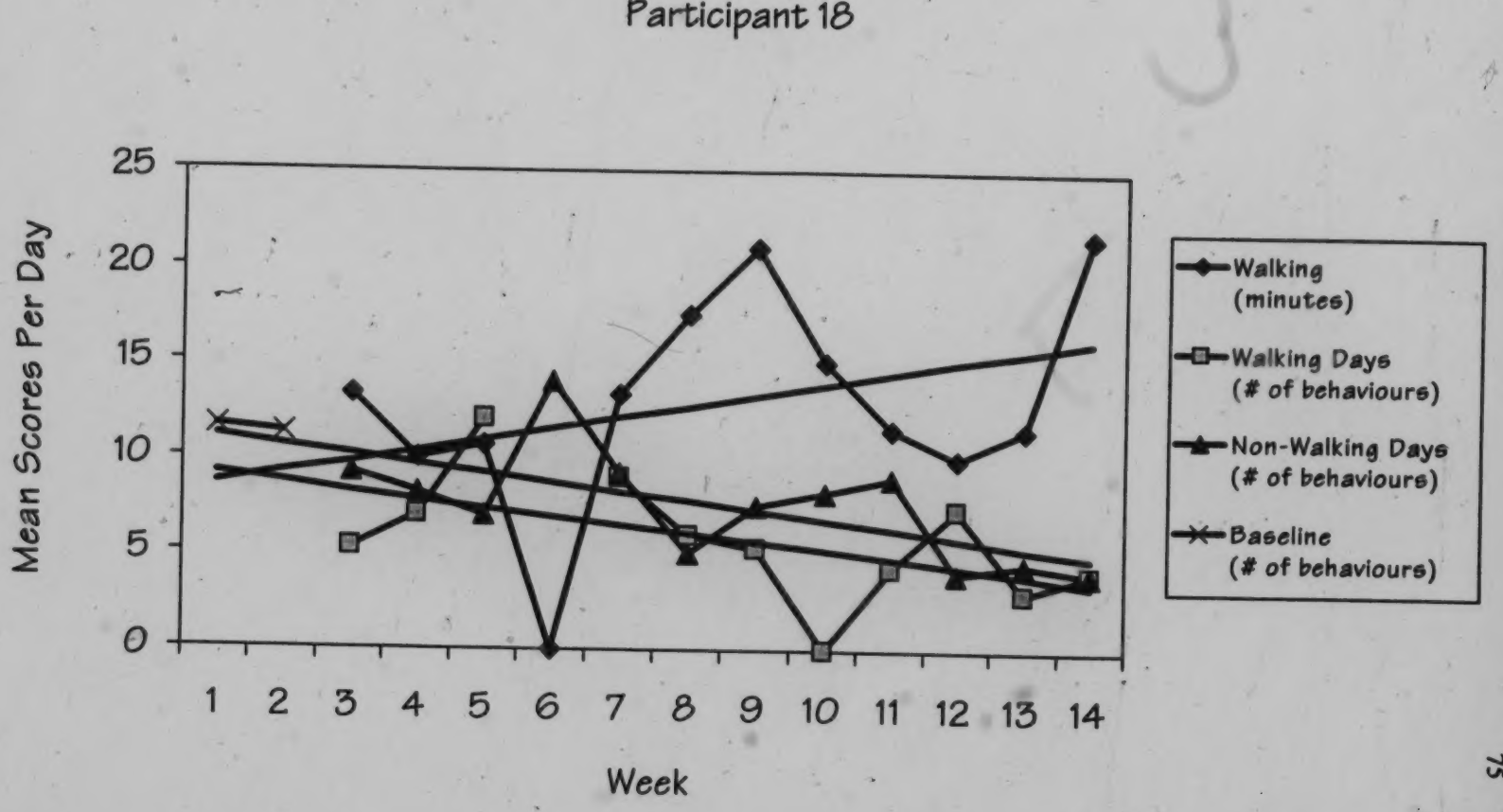
Weekly Totals of Inappropriate Behaviours														
	Week													
	1	2	3	4	5	6	7	8	9	10	11	12 **	13 *	14
Layering	16	2	2	3	0	3	5	1	0	0	0	2	0	0
Verbally Abusive	9	17	3	7	3	0	6	3	4	6	10	3	3	0
Going into other's Rooms	9	20	22	9	17	10	13	6	14	5	6	5	0	2
Disturbed Sleep	47	40	26	37	44	85	40	29	28	38	28	17	18	26
Total	81	79	53	56	64	98	64	39	46	49	39	20	21	28
Walk Time	0	0	40	10	32	0	40	70	63	15	46	30	68	65

Note:

* one day of missing data

** two days of missing data

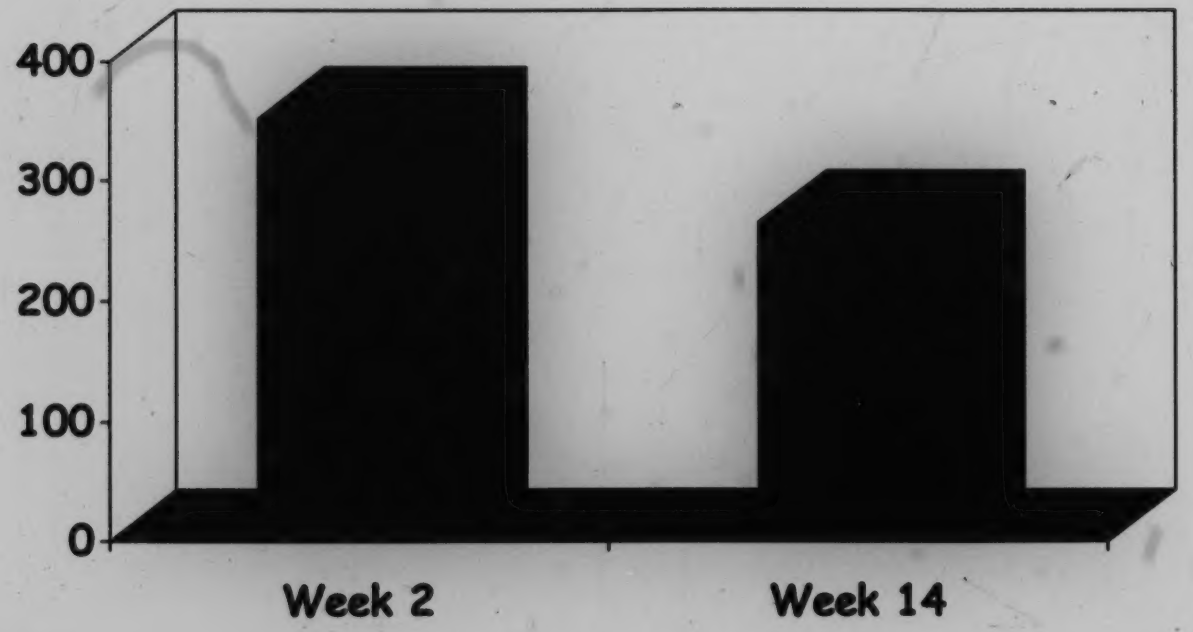
Figure 18. Mean # of Inappropriate Behaviours on Walking and Non-Walking Days and Mean Walking Time Over 14 Weeks



Staff Data

The tota scores from the 34 item Caregiver's Hassles Scale from week 2 were compared to those at week 14. The total score at week 2 was 352 while the score at week 14 was 266, indicating there was a 24% decrease in the staff's perceptions of hassles related to caring for the study participants. The five items showing the largest decreases as perceived by staff hassles included: care recipient talking about/seeing things that aren't (75% decrease), dressing care recipient (60% decrease), bathing care recipient (53% decrease), care recipient hiding things (46% decrease) and care recipient's agitation (43% decrease). The following histogram illustrates the total scores of the care staff at week two and week 14 of the walking program. Please see Table 2 for a summary of the 34 items used and their respective scores.

Figure 19. Caregivers Hassle Scale Scores at the end of Week 2 and Week 14



Group Data

Although examination of single participant behaviour changes over time were the main thrust for evaluating the effectiveness of a walking program, some group data (n= 16) were examined at a descriptive level. Because the intervention groups were not equal in size, matched or randomized, statistical analysis was not conducted. During the 14 day baseline period, the "walking + socialization" group (n= 12) exhibited a total of 1411 behaviours, averaging 8.3 behaviours per day per resident. The socialization group (n= 4) exhibited a total of 387 behaviours, averaging 6.9 behaviours per day per resident during the same baseline period. During the last 14 days that each participant was in the study, the walking group exhibited a total of 925 behaviours, averaging 5.5 behaviours per day per resident, while the socialization group exhibited a total of 269 behaviours, averaging 4.8 behaviours per day per resident.

At the end of the 12 week intervention, the "walking + socialization" group had reduced their frequency of inappropriate behaviours by an average of 34%. Meanwhile, the socialization group reduced their total inappropriate behaviours by 30%. Moreover, 11 of the 12 participants in the "walking + socialization" group exhibited at least 10% fewer inappropriate behaviours by the last 14 days of the study, while only two of the four socialization group participants showed similar decreases in the frequency of inappropriate behaviours. Decreases in inappropriate behaviours for the 12 "walking + socialization" participants ranged from 8.7 % to 68%. Two socialization participants decreased the frequency of inappropriate behaviours by 55% and 66%, but two others exhibited increases of 15% and 22%. However, due to the fact that procedures involving small, non-random assignment groups are vulnerable to extreme scores by one or more people and are likely to have reduced variability, readers are cautioned in generalizing the

results. Please refer to Table 2 for a list of all observed inappropriate behaviours and their frequencies for both groups during the end of week 2 and week 14.

CHAPTER 5

Discussion

The main goal of this study was to investigate the effects of a walking program with respect to reducing some of the inappropriate behaviours exhibited by residents with Alzheimer's Disease in a long-term care facility. The study also examined the effects of this program reducing the burden placed on individuals caring for this population. The overall scores indicate that 11 of the 12 participants in the "walking + socialization" group decreased the frequency of their inappropriate behaviours, while only two of the four participants in the socialization group decreased the frequency of their inappropriate behaviours. This suggests that the stimulation that residents were receiving, either socially or physically, had the ability to decrease some of their inappropriate behaviours. These results support the hypothesis that a walking program has the potential to alleviate some of the agitation associated with being, sedentary and as a result has the potential to decrease the extent of hassles felt by the caregivers.

Socialization Intervention

The socialization only group consisted of four individuals. Two of these individuals showed decreases with respect to their inappropriate behaviours, while the other two individuals showed slight increases. The individuals that showed decreases were both monitored for behaviours that required the full attention of the staff. These inappropriate behaviours included unwarranted crying, attention seeking, disturbed sleep, verbal abusiveness and territorial behaviours. The intervention provided one-on-one attention and perhaps resulted in these individuals' needs being met. The individuals

that showed increases of inappropriate behaviours were both monitored for verbal abusiveness and being a loner behaviours. In addition, one individual was being monitored for hoarding while the other was monitored for unwarranted requests. These inappropriate behaviours do not necessarily require the full attention of the care staff, therefore, were not affected by the additional stimulation.

Walking + Socialization Intervention

Of the 14 participants that were included in the "walking + socialization" group, 11 remained in the study for the duration while one other individual remained in the study until mid-way through the final week. The other two participants that chose not to participate after week 8 and week 9, may have not enjoyed walking but might have participated in a different activity. Staff and recreation therapists for this population have to recognize each individual's needs and/or wants to provide meaningful, appropriate activities. Of the 12 walking participants, only one did not exhibit a 10% or more reduction in the frequency of inappropriate behaviours. These are promising results that indicate the importance of a socialized walking program. In addition to being a possible symptom management technique, the physical activity portion also provides residents with the many health benefits of being physically active.

Residents at this particular long-term care facility usually walked in groups of three to five, according to group dynamics and pace. Walking in groups was more efficient than walking one-on-one, and allowed for socialization among group members. However, some residents may require the assistance of an arm or hand, therefore it is important, from a safety perspective, not to include more than two people requiring assistance in one group. Group pace was an important factor to consider because often residents can become agitated if the pace is too fast or too slow, which in turn can agitate the

other members in the group. Providing a stimulating, positive experience was the main goal.

When walking, there is always a risk of falling, although there were no falls recorded during the program. The particular facility included in this study had carpeted floors, so the risk of slipping on a wet surface was alleviated. Residents should not be restricted to walk only on carpeted floors, however, pre-cautionary measures should be taken to ensure a safe walking surface. Choosing a walking route that is familiar, safe, accessible, stimulating, convenient, and provides rest stops (chairs or benches) is highly recommended. The walking study also implied the importance of pursuing the walking program in a casual and social manner, as opposed to a more regimented approach, therefore background information on each individual is helpful because it enables the volunteer or care staff to facilitate conversations of personal interest.

Caregivers Hassles Scale

The care staff showed a 24% decrease over 12 weeks with respect to the frequency and extent of perceived hassles. It is well known that the stress levels of those caring for the AD population are very high, and therefore lower scores on the Caregivers Hassles Scale implies that staff may benefit from residents being involved in a walking program. Residents who take part in a daily walking program may reduce some of their inappropriate behaviours and, as a result, reduce some of the burden placed on staff. When staff see residents walking well they may realize that residents are capable of more than they thought. This may reduce the stresses staff may perceive to do 'everything' for the resident. Walking is not just beneficial to individuals with AD. Volunteers, family members and friends should be encouraged to take an individual with AD for a walk to allow the care staff some respite, and also to get some exercise of their

own. Moreover, having only one walking technician for 20 residents suggests that the program could easily be implemented by a volunteers, family or friends on a one-on-one or smaller group basis. Education and new perspectives need to be developed to ensure that active recreation pursuits are not considered a chore, but a pleasant way to promote health and well being for all.

Limitations

Replicating this study with a larger sample and random assignment to intervention groups would strengthen the findings and allow researchers to make generalizations to a larger population. For example, the fact that participants were assigned to intervention groups based on others' opinions of their ability to participate in and/or enjoy a walking group limits the generalizability of the results of the walking program to people with mild AD, who are ambulatory and are judged likely to enjoy walking. In addition, the amount of time spent with each participant was dependent on each resident's choice to participate. The socialization group spent less time with the technician, possibly because it was difficult to maintain a one-on one conversation for a significant period of time. Therefore, if a socialization group was to be included in future research, a more structured, group , social time would be beneficial. Potential activities include story telling, sing-a-longs, or reminiscing.

Another limitation of this study was the inclusion of individuals who did not frequently exhibit inappropriate behaviours. The low number of inappropriate behaviours exhibited prior to the intervention limited any potential improvement (i.e., these participants exhibited a floor effect). Moreover, this number of inappropriate behaviours exhibited likely did not warrant symptom management. A minimum number of

inappropriate behaviours, or perhaps consideration of the seriousness of a behaviour, should be considered prior to participant inclusion. A suggested number of inappropriate behaviours would be a minimum of 5 inappropriate behaviours per day. Also, a longer baseline period may provide a more reliable assessment of inappropriate behaviours to determine participant inclusion.

Although the amount of time spent walking with the walking technician was recorded, a pedometer may have been useful to validate the distance each participant walked throughout the entire day. This may help to determine the optimal amount of time /distance a participant could and should walk. In addition, monitoring walking throughout the waking hours would provide more information about overall walking activity. However, the amount of time a resident walked by themself or with a family member or staff was not tracked in the present study.

The amount of time spent walking each day increased over time and as a result, the walking technician was increasingly unable to ensure that everyone had walked and/or socialized an optimal amount. In future, the assistance of more than one walking technician would be highly recommended.

During the summer months, residents at this facility are free to go outdoors unattended if they choose. However this was not an option made available to them during the winter months in which the study was conducted (October –January), due to cold weather and icy pathways. As a result, most of the walking program took place indoors and limited the possibility of using outdoor resources (pathways, conversation pieces, larger walking area, change of scenery) to enhance the walking program. Having to walk the same route indoors, and to co-ordinate the walking times with the shorter winter days, as well as and the lack of sunshine made the walking program experience

challenging at times.

Although care staff were not informed of the purposes of the project, or who was likely to benefit from the walking program, they could easily learn about which residents were involved in the study and what type of information the Caregivers Hassle Scale questionaire was intended to collect. With any non-blind study the risk of bias is present and therefore needs to be recognized as a limitation in this study. For instance, staff may have felt that having an extra person, like the walking technician, to spend time with some of the residents was helpful. Therefore, they may have tailored their observations to indicate that additional staff or volunteers are needed.

Staff may have recorded fewer observed incidences of inappropriate behaviours, or fewer 'hassles', because they anticipated benefits from the study. To reduce staff purposely recording fewer observations based on previously recorded data, the customized data sheets were collected by the investigator on a weekly basis. In addition, the Caregivers Hassle Scale was administered 12 weeks apart and therefore it is unlikely individual remembered their responses to the initial questionaire. Having only used 34 items from the 42 item caregiver hassles scale may have affected the validity and reliability of the scale, but some items had to be omitted because they were not relevant to the present study.

Finally, staff were required to record data 24 hours a day, 7 days a week and, therefore, over the 14 week duration there may have been less care and attention given to accurately recording their observations. Staff were given instructions at the beginning of the project about how to properly record their observations, however no further reminders on procedures were given. As a result, staff may have become less diligent.

CHAPTER 6

Conclusion

In conclusion, this study illustrated the potential of decreasing inappropriate behaviours associated with Alzheimer's Disease in individuals who agreed to go walking on a regular basis. The study indicated that a walking program taking place 5 days per week for up to 60 minutes per walk reduced the frequency of inappropriate behaviours exhibited by participants.

The walking program implemented was safe and effective, and considered by the manager and the staff to be feasible and appropriate. A daily walk is appropriate as most of the participants consented to a participate each day. The walking program was easy to implement, cost effective and did not require the use of staff time.

Finally, the findings that staff felt less 'hassled' by the end of the 12 week intervention holds promise for future research to pursue the possibilities of reducing the burden felt by persons caring for individuals with AD through this and other forms of physical activity.

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Appendix A

Example of Customized Data Sheet

Date:_____ Participant : Observer:_____

Behaviour	7:00 am - 8:00 am	8:00 am - 9:00 am	9:00 am - 10:00 am	10:00 am - 11:00 am	11:00 am - 12:00 noon	12:00 noon - 1:00 pm	1:00 pm - 2:00 pm	2:00 pm - 3:00 pm
Physically Aggressive								
Verbally Abusive								
Constant requests								
Disturbed sleep patterns								
Layering								

Date:_____ Participant: Observer:_____

Behaviour	3:00 pm - 4:00 pm	4:00 pm - 5:00 pm	5:00 pm - 6:00 pm	6:00 pm - 7:00 pm	7:00 pm - 8:00 pm	8:00 pm - 9:00 pm	9:00 pm - 10:00 pm	10:00 pm - 11:00 pm
Physically Aggressive								
Verbally Abusive								
Constant requests								
Disturbed sleep patterns								
Layering								

Date:_____ Participant: Observer:_____

Behaviour	11:00 pm - 12:00	12:00 midnight 1:00 am	1:00 am - 2:00 am	2:00 am - 3:00 am	3:00 am - 4:00 am	4:00 am - 5:00 am	5:00 am - 6:00 am	6:00 am - 7:00 am
Physically Aggressive								
Verbally Abusive								
Constant requests								
Disturbed sleep patterns								
Layering								

Appendix B

Inappropriate Behaviours Form

I am interested in retrieving information about the residents you care for with respect to "common inappropriate behaviours". I would like you to write down the 5 most inappropriate behaviours that you see in this individual. The information that you provide is VERY important to the success of the socialized walking program, so please be as specific as possible. Once the lists are compiled the behaviour will then be grouped into a less specific classification. For example, "kicking" may be termed "physically aggressive" and "cursing at others" may be considered "verbally abusive". Thank you for your time and co-operation. Please complete this form individually and return to me within 72 hours.

Name
1.
2.
3.
4.
5.

Name
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Name
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Name
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Name
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Appendix C

Definitions

PHYSICALLY AGGRESSIVE: (to others or to self)

hitting : striking others, punching
kicking: strike forcefully with feet
pushing forcefully: thrusting, shoving
scratching
throwing items: hurling violently, flinging items, pushing items from surface, tossing items up in the air
biting people
destroying property or tearing things aggressively

VERBALLY ABUSIVE

cursing at others
swearing
use of obscenity
profanity
verbal threats
personal attacks (i.e., "you don't know what you are talking about")
blaming others

CONSTANT UNWARRANTED REQUESTS

verbal or non-verbal
unreasonable nagging
pleading
demanding

SEEKING ATTENTION

clinging to others (staff, residents, family members)
following others (staff, residents, family members)
calling attention to themselves (i.e., "I'm hurt")

DISTURBED SLEEP PATTERNS

getting up and leaving their room after they have initially gone to bed
awake but do not leave their room
refusing to go to bed

napping a lot
LAYERING

inappropriately putting additional clothing on
requesting to be dressed after already being dressed
re-dressing themselves for no apparent reason
inappropriately undressing themselves

HOARDING

hiding items
taking other residents personal belongings
taking items to their room that do not belong to them (towels, plants, cutlery, etc)
rummaging or looking for items

GOING INTO OTHERS ROOMS

going into others rooms uninvited (includes sleeping in someone elses bed)
attempting to go into others rooms (i.e., going in and being asked to leave)
trying to get into locked areas

UNWARRANTED CRYING

sobbing, weeping, crying for no apparent reason

TRYING TO LEAVE FACILITY (verbally or physically)

requests to leave the facility
attempts physically to leave the facility
strategically sits near a door in hopes to leave facility
requests for the door code
sneaks out of facility

TERRITORIAL

acts possessive of an area or an item (i.e. chair, telephone, cats, staff members etc)

PERFORMING REPETITIOUS MANNERISMS

re- doing tasks (i.e. setting table)
banging or tapping surfaces or items
repetitive movements
repetitive requests
ritualistic behaviours (i.e. humming)

LONER

wants to be alone
spends great deal of time in room
does not participate in activities
will not socialize

Appendix D

Cover letter to guardian/next of kin

At this time, I would like to welcome you and your family member to McConnell Place West. My name is Allison Bonner and I am a Master's student in Exercise Gerontology at the University of Alberta. I have received permission by The Capital Care Group to pursue my research at McConnell Place West after completing a pilot project at McConnell Place North. The research literature to date suggests that physical activity may reduce the complications associated with Alzheimer's disease, and there is now speculation that physical activity slows the progression of this disease. In short, I am looking to determine if a planned walking program for AD residents will a) eliminate inappropriate behaviours associated with AD, b) improve or maintain cognitive function, c) improve quality of life, and d) reduce caregiver burden. The study involves a socialized walking program that consists of up to 30 minutes of walking, or more if possible, 5 times a week for 12 weeks. Participants will go for daily walks with a walking technician and will be observed and evaluated by participating staff. There are no known harmful effects involved and participants may withdraw, either voluntarily or by your request. Please see attached sheet for a summary of the project. Upon admittance, patients are often given the Mini Mental State Examination by the institution, therefore to avoid completing the test twice, researchers may request to observe a participants chart to obtain the appropriate information.

If you are interested in having your relation involved with the study please contact me at 440-0945 or email me at abonner@gpu.srv.ualberta.ca. I will be more than happy to answer any questions or concerns you may have. Thank you so much for your time.

Sincerely,

Allison Bonner

Appendix E

Project Summary

The objective of this study is to determine if a daily socialized walking program with Alzheimer's-affected adults will make life easier, both for the participants and their caregivers. Specifically we hope to see improvements with respect to moving better, behaving better, thinking better and feeling better. If daily walking can promote function and health in these ways, then caregivers may also benefit in terms of reduced demands on care giving responsibilities.

With family consent, up to 24 older AD residents from McConnell Place West will join a 30 minute, 5-days-a-week, 12-week socialized walking program. Residents will be observed for 2 weeks prior to the start of the walking invention in order to identify their unique problem behaviours and their frequency. Once this starting baseline is established, groups of 6 residents will be accompanied, for up to 30 minutes or more if possible, by a trained walking technician over progressively longer distances and slightly faster pacing. A daily log of behaviours specific to each individual will be kept by paid staff and plotted in a time-series framework such that each participant acts as their own control. In addition, assessments may be monitored with respect to thinking better (Mini-Mental State Examination). A final measure pertains only to the staff, and this will measure the level of care giving burden. The time series data will be analysed to see if any of the problem behaviours are alleviated by the walking intervention. Simple tests of significant difference will be conducted on the 2 week baseline and 12 week intervention

Ambulatory individuals with dementia seem to need a large amount of physical exercise and previous studies have reported that wandering, senseless behaviour, and general agitation do decrease with adequate exercise. Something as simple as a daily walking program may provide the stimulation and expression of energy that would relieve the inappropriate behaviours associated with the disease, thereby relieving some of the burden experienced by staff. Wandering is a common behaviour associated with dementia, and therefore a walking program seems to be most appropriate because it matches the behaviour physically, is low-skill, and has potential for social and psychological stimulation. Walking is also a low-cost, natural activity pattern that can be done with families, residents and volunteers. If daily walking can be successfully implemented in the care settings of AD affected adults, and the benefits of this kind of recreational activity can be successfully measured, then other facilities and even home-based care services will be encouraged to adopt similar programs.

With time, we anticipate that residents will be able to walk faster and further in the 30 minutes. Such changes in fitness are associated with quite profound cognitive and functional benefits among other older adults, and the AD adults may also gain these benefits, feel better, and subsequently experience less agitation. If improved function occurs, we predict that AD residents will improve their quality of life (improving appetite, sleeping better, feeling less restless and so on). Since gait speed is an indicator of overall functional fitness, increased independence for self-care activities is anticipated. In sum, the walking program is expected to provide substantial and measurable improvements to both AD affected adults and their caregivers.

Appendix F

Family Informed Consent Form
Socialized Walking Program for Alzheimer Patients
Investigator: Allison Bonner
Phone: 440-0945

Studies show that daily exercise will improve health, prevent disease, and help people feel better. However, we don't know about the benefits of regular exercise for people who are dealing with Alzheimer's disease. For my graduate thesis, my advisor and I have developed a study to see if a daily walking program will:

1) Reduce problem behaviors associated with Alzheimer's disease.
2) Improve or maintain mental function.
3) Improve daily fitness.
4) Improve physical ability.
5) Reduce the burden of care on those who look after the person.

Participants will complete up to 30 minutes of walking, or more if possible, 5 times a week for 12 weeks. Participants will be helped by a walking leader and observed by staff. These observations will be reported to the researchers in order to follow observed changes. All information will be kept confidential. Family members are invited to give feedback at any time. There are no known risks involved in participation of this study. Anytime people are walking, falling is a possible risk, therefore researchers are not liable if an injury is incurred. Walking routes will be chosen with safety in mind. If at anytime the participant wants to withdraw, or you want your family member to withdraw from the study, there will be no penalty.

Informed Consent Form

I, _____, allow for consent of my
(next of kin)
_____, _____ to participate in the study
(relation of) (name of participant)

being done by Allison Bonner and Dr. Sandy O'Brien Cousins. I know that the results are private, and will be used for research reporting. No information identifying the person will be published. I know that participation in the study involves being observed by care staff on a daily basis. I know that taking part includes walking for up to 30 minutes, 5times a week for 12 weeks. If I wish, participation can end at any time. I will be given a copy of this signed Informed Consent Form to keep. If I have any concerns about any part of this study, I may phone the Patient Concerns Office of the Capital Health Authority at 474-8892. This office has no connection with the people doing the research.

Date _____ Signed_____

Investigator_____ Witness _____

Appendix G

Caregiving Hassels Scale

Dr. Jennifer Kinney and Dr. Mary Ann Parris Stephens

Hassles are irritants- things that annoy or bother you; they can make you upset or angry. Some hassles occur on a fairly regular basis and others are relatively rare. Some have only a slight effect, whereas others have a strong effect.

This questionnaire list things that can be hassles in day to day caregiving. You will find that during the past week some of these things will have been a hassle, whereas other have not.

For each item, indicate whether the event occurred during the past week, by circling the word "yes" or "no". If you circle "no", go on to the next item. If you circle "yes", indicate how much of a hassle it was for you during the past week by circling the number. Please only circle one number.

1. Care recipient criticizing/ complaining YES NO

Not at all a hassle	Somewhat a hassle	A hassle	A great deal of hassle
0	1	2	3

2. Care recipient declining mentally YES NO

Not at all a hassle	Somewhat a hassle	A hassle	A great deal of hassle
0	1	2	3

3. Assisting care recipient with walking YES NO

Not at all a hassle	Somewhat a hassle	A hassle	A great deal of hassle
0	1	2	3

4. Friends not showing understanding about caregiving YES NO

Not at all a hassle	Somewhat a hassle	A hassle	A great deal of hassle
0	1	2	3

5. Care recipient losing things YES NO

Not at all a hassle	Somewhat a hassle	A hassle	A great deal of hassle
0	1	2	3